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UTERINE HERNIA IN A FOX-TERRIER BITCH: UNASSISTED PARTURITION.

BY CHARLES SHEATHER, F.R.C.V.S., LONDON.

On Saturday afternoon, June 4th, a very handsome fox-terrier bitch, twelve months old, was brought to me by her owner, with the following statement:—Her period for parturition was due about Wednesday, June 8th; he had taken her out for a little exercise, when, in crossing the entrance to a mews, a hansom cab-wheel had run right across her body at the loins. Immediately she rose he noticed that the left flank was very pendulous, and he could feel the puppies close under the skin, and one appeared to be under the skin of the left thigh. He brought her for examination and advice.

An examination yielded the following results:—A rupture of the abdominal wall in the left inguinal region tending towards the linea alba; descent through this rupture of the left cornu of the uterus. Two live fœtuses were in close proximity to the skin, their movements being easily noted; one had descended under the skin inside the left thigh, which was ecchymosed. The bitch was apparently free from pain, particularly quiet and tolerant of manipulation, and would walk about if allowed.

It was decided not to interfere surgically with her until absolutely necessary, but it was anticipated that in all probability Cæsarean section would in the end have to be undertaken. She was carefully bandaged, received some sedative medicine, and instructions given to feed her on beef tea and oatmeal gruel, small quantities at a time.

Professor Axe had an opportunity of seeing her on Sunday morning, and he also expected that Cæsarean section would become imperative. On Monday there was little change, the left side of the

abdomen presented extensive ecchymosis, and three fœtuses could be distinguished, two of which moved ; the bandage was re-applied, and preparations were made to carry out the operation, should it become necessary, under the most favourable conditions.

During the night the bowels acted for the first time since the accident, the fæcal matter being coated with blood-stained mucus.

At eleven p.m. on Thursday labour pains came on, and at 4.15 a.m. on Friday the first puppy was born, and in succession five others. Nos. 1, 3, 5, and 6 were alive, No. 6 dying during expulsion, while Nos. 2 and 4 were dead, black, had little hair on them, but were not fœtid. She received no assistance except the careful attention of the owner, Mr. A. Bacon, and between the times of the accident and her delivery, fed well on the diet allowed her, and was very quiet, occasionally getting about in spite of precautions to keep her still.

The hernia disappeared immediately after delivery, and on June 18th the rupture could not be distinguished, but there was from the time of delivery to this date œdema of the left thigh, which subsequently cleared out, and the bitch and her three pups are in the best of health.

LAMENESS IN THE HIND LIMB; DIAGNOSIS OF THROMBUS.

BY THE SAME.

On September 15th, 1884, a bay mare, the property of H. P. M—, Esq., was sent by rail to my infirmary, with the request that I should examine her as to a lameness in the near hind leg and give advice.

The patient was a very handsome, well-bred bay mare, about nine years old, possessed of high courage, great power, and activity ; at the same time her manners were perfect, she was very tractable and invaluable as a tandem leader. She showed slight Stringhalt of the ordinary type in both hind limbs, and had done so ever since she was purchased three years before ; she had never suffered in any way during this period, as far as could be discovered.

On making an ordinary examination it was found that when quietly trotted she showed a very slight lameness of the near hind limb ; in fact, it was only just perceptible. Physical examination of the affected leg, including the foot, revealed no cause, in my opinion, for the very slight lameness, and when she was in motion it was noticed that the hocks and fetlocks were evenly flexed, that the toes were carried free of the ground to an even height, that the

lengths of stride of the hind limbs were equal, that there was no drooping of the hip, and that the tail was well carried. There was no alteration in temperature of any part of the limb, and the sinking movement of the pastern was perfect.

I communicated with the owner, commenting upon the unsatisfactory results of my examination, asking permission to drive her, and to be given a detailed account of the earlier symptoms.

From an interview, I discovered that the mare had been perfectly well until about three weeks before being sent to me. She had been idle in a loose box for a fortnight, her owner being in London, but on his return into Hampshire she was harnessed one morning to go as leader, and began her journey, but after going about a quarter of a mile a slight lameness appeared and progressively got worse. She was at once taken back, rested for two or three days, and tried again with the same result; she was then sent on to me in London.

I had her harnessed to a light Beaufort cart, and drove her into the inner circle of Regent's Park very quietly; then pushed her along at about twelve miles an hour. After passing about half-way round I noticed her failing to advance the near hind leg so well as she had been doing, and to be labouring with the whole quarter; I still pressed her, and she became so lame as to necessitate my stopping.

She had travelled nearly twice round the circle, a distance somewhat under two miles. I drew up at the side of the road to make an inspection of her hind leg, and to avoid puddles, as it had been raining; she was thoroughly wet under her body and about her thighs and legs, and I noticed vapour rising from her off hind leg, but none from her near hind leg. Dirty though she was, I put my hand on her near hock and found it quite cold, contrasting to a great degree with the other. Perspiration in beads was oozing through the hair of the near quarter, and rolling down; it was not an evenly diffused perspiration, as between the beads the hair was dry, and it was localised to the near quarter.

On passing round to the off side of the mare, I noticed a marked absence in the near hind leg of the distension of the Vena saphena, usual after exercise, and particularly apparent in well-bred, high-couraged animals when the hair of the legs is wet. After watching a few minutes, I noticed it to slowly fill to the capacity of its fellow.

I had obtained a very strong clue as to the nature of her malady.

I walked her back to the infirmary, and in a quarter of an hour had her trotted in hand, when she went nearly sound. My conclusion was that obstruction existed somewhere in the arterial

system of the near hind limb, and that the circulation was rendered very defective by movement. I concluded my examination that day by a rectal exploration, with a view to determine, if possible, the seat of the arterial obstruction. I was rewarded by finding no pulse in the iliacs of the left side, but a bounding throb of an exaggerated character in the posterior aorta.

After carefully studying the case, I communicated my diagnosis to the owner, and recommended that the mare should be destroyed.

As might be expected, the owner was not disposed to act upon this advice at first, and while he was arriving at a decision, I took the opportunity of sending the mare to the Royal Veterinary College, as she was a most interesting case, where Professor Axe confirmed my diagnosis.

On October 14th I received instructions to submit the mare to an examination at the hands of an eminent veterinary surgeon. This was done, and I wrote, when sending the mare, giving all the details of what I had observed, so that an off-hand opinion might be guarded against; she, however, was returned the same day with the recommendation to fire and blister both hocks, as she had spavin in both. At the request of a medical friend of the owner the mare was kept in a loose box, and for a fortnight received a few grains of Pulv. fol. digitalis.

Early in November the left submaxillary artery became occluded, while the pulse was good and normal in the other.

About the 20th of November I received permission to destroy the mare; this was done at the *Post-mortem* House of the Royal Veterinary College, and Professor Axe made the autopsy in my presence.

The external iliac artery of the left side was nearly occluded by a yellowish-white firm laminated thrombus; the thrombus extended to the origin of the Arteria profunda femoris, and occluded the opening into the circumflex ilii, and partially that into the internal iliac, and projected into the posterior aorta.

An examination of the endothelial surface of the external iliac artery led to the discovery of several spots of Atheroma, a condition not so apparent in the submaxillary artery. Is it possible that this condition of artery may influence nutrition locally, and so induce Stringhalt? Perhaps an exhaustive exploration of the arteries of the body may have led to further discoveries. The heart and lungs were free from any abnormal condition likely to give rise to emboli. The interest of the case centres in the symptoms, one of which is worthy of note; when the mare was trotted as fast as she could go, it took seven to eight minutes to bring on the extreme lameness and perspiration, and a rest of a similar

period restored her to her former condition. The certainty and regularity in the production of the extreme lameness were most marked, and form a link of diagnostic value. Mr. William Hunting also saw the case, which I think worthy of record, as I believe it to be the first time that a lameness has been *definitely* diagnosed as arising from thrombosis, although the condition has been recognised at *post-mortem* examinations.

I think a careful study of the symptoms observed in this case may assist us, if only in the negative direction, in differentiating cases of hind-limb lameness, which are difficult of diagnosis.

PURPURA HÆMORRHAGICA, A SEQUEL OF ACUTE RHEUMATISM.

BY R. W. BURKE, M.R.C.V.S., ARMY VETERINARY DEPARTMENT, JUBBULPORE, INDIA.

In the admirable article by Professor Limont in the July number of the Veterinary Journal, I do not notice any reference to the proper classification of the disease, perhaps owing to the professor's wish to confine his inquiries to the subject of the organisms peculiar to it. Little, however, can be inferred from any microscopical observations, as the professor notes, except that the pathology of Purpura Hæmorrhagica is worth looking into; and I fail to see how we may reasonably gauge the significance of any organisms found associated with this disease, while we remain ignorant of its classification. I do not think that text-books have enlightened us much in the past on this subject. Veterinary writers commonly classify Purpura Hæmorrhagica in the horse among general derangements of the blood produced by unknown causes. From time to time, however, one meets with instances of marked Purpura Hæmorrhagica following on cases of Acute Rheumatism. I have lately seen examples of this in a pony belonging to General East, commanding Saugor district; in a horse belonging to a Mr. Cooke, Superintendent of Surveys; in a battery horse lately under observation; which were treated in this station, and in several others treated at Saugor, in all of which cases Acute Rheumatism appeared to act as the direct exciting cause of the cutaneous trouble, generally in the form of diffuse œdema, papular eruptions, ecchymoses and extravasations, amounting in some cases to hæmorrhage, which was sanguineous or sero-sanguineous in character. The symptoms of Rheumatism in some, though not in all of my cases, persisted long after the disappearance of the cutaneous lesions. I have examined the blood in several cases, and found several kinds of

organisms, numerous separate cocci, as well as in groups and slender rods, but as no inoculation experiments were conducted with these, I do not personally attach any importance to their presence. The pathology may be summed up briefly as Acute Rheumatism, characterised by certain cutaneous and other results of multiple thrombosis and embolism. This was at least Trousseau's view of these symptoms of Acute Rheumatism in man, and it is the view accepted by the foremost physicians of to-day in England. It must be remembered that Rheumatism may occur without any joint symptoms. These irregular forms of Acute Rheumatism are, I have reason to believe, more common in our animals than is generally supposed, which have hitherto been vaguely described under the head of "blood disorders of an unknown origin."

Alkaline treatment proves most efficacious. Tincture of steel, iodide of potassium, salicylic acid, etc., which are recommended for Rheumatism, have been found most useful in cases of Purpura Hæmorrhagica in the horse.

DISLOCATION OF THE SHOULDER IN THE HORSE.

BY J. A. NUNN, F.R.C.V S., ARMY VETERINARY DEPARTMENT, NATAL.

ATTENTION having lately been drawn to dislocation of the shoulder in the horse, perhaps the following case, the only one I have ever seen, may be of some interest to your readers. The animal, if I recollect right, was an Australian gelding, of the 6th Dragoon Guards (Carabineers), and formed part of the escort that conveyed the ex-Ameer of Cabul from Fort Basawal, where I was stationed, to Lundi Kotal, on his way to India in November or December, 1879. The horse took fright and bolted, jumping or stumbling down a bank, four or five feet high, on the left-hand side, into a rice field, which was soft mud, three feet deep. From this he was pulled out on to the hard road, with difficulty. I saw him very shortly afterwards, and found the near fore limb, if my memory serves me rightly, shorter than the other, resting on the toe, no weight being put on it, with about three or four inches behind, and the same above, where the point of the shoulder would be normally situated, a deformity and hard swelling, which, in the confusion and hurry, I mistook for a fracture of the neck of the scapula. Unlike the cases published, the animal was utterly unable to use the limb, which swung uselessly when made to walk. As an attack was expected every minute, I had him destroyed, and examined the part as well as I could with a pocket-knife, when I found that the supposed fracture was, in reality, the dislocated

head of the humerus, which had been dislocated outwards and upwards, lying on the outside of the scapula, under the ridge. The capsular ligament was extensively ruptured, but I was unable to make a further examination on account of the near approach of the enemy. When the country become quiet I rode out to try and obtain the specimen, but the jackals and vultures had been before me.

COCAINE AS A LOCAL ANÆSTHETIC.

BY J. T. KING, M.R.C.V.S., BOURNEMOUTH.

LAST month my advice was asked respecting the condition of the off eye of a horse belonging to a medical gentleman of this town. On examination the eye presented a swollen and bulging appearance of the upper lid; there was a copious discharge of tears, and almost complete closure of the eyelids. It was impossible to elevate the lid, so I determined to reduce the inflammatory condition by giving a dose of aloes and warm fomentations, etc., to the part. This treatment was continued for two or three days; at the expiration of that time I was enabled to examine the eye more easily. I found on the internal surface, deeply imbedded in the structure of the lid, a fibrous tumour, which covered a great part of the eyeball. I informed my client that excision of the growth was the proper treatment to adopt; he gave his consent, and I arranged to operate on the next day.

The animal, a high-spirited, well-bred beast, was brought to my infirmary, and I decided to use a ten-per-cent. solution of cocaine as a local anæsthetic. The groom was positive the operation could not be accomplished unless the horse was cast.

I painted the conjunctiva with the cocaine, and then hooked the lid back, after waiting a minute or so I applied another painting, and then dissected the tumour out. The horse stood perfectly still during the operation and did not evince the least sign of pain. He walked home as well as ever directly after, the general health not being at all interfered with.

After about a week's ordinary treatment the animal was put to work.

It seems that cocaine will prove a most valuable and useful agent in veterinary practice where a local anæsthetic effect is required.

Since the above, I have used cocaine in a case of lacerated wound of the upper eyelid of a horse. The operation was most easily performed whilst the animal was under the action of the drug, the passage of the needle through the torn edges of the wound being quite painless.

CASTRATION.

BY T. HUNTER, V.S., SKENE, ABERDEENSHIRE.

THE castration of horses, etc., seems such a simple operation that one feels astonished at so many complicated modes and appliances being in vogue for its accomplishment. I have seen the operation performed by the screw, the actual cautery, the caustic clams, torsion, ligature, suture, the ecraseur, etc., but have never become enamoured with any of these, feeling convinced that the simpler any operation can be performed the better. I look upon all these plans, then, as quite unnecessary, too mechanical, clumsy, and unscientific, and find no need for any machine or instrument, with the exception of a keen-bladed knife used freely and fearlessly upon previously scrupulously-cleaned tissues, guarding the spermatic artery, which is held tense and gradually scraped, each stroke of the knife going towards the animal, which drives the blood backwards, and in about a minute there is a separation, with the rough and ragged ends of the muscular coat of the artery contracted and curled in, and the blood-course effectually stopped. In bulls of all ages, standing on their feet, I prefer to sever the cord *minus* the knife, between the finger and thumb, using the nail of the latter for scraping.

A HERMAPHRODITE.

BY THE SAME.

IN the beginning of the grass season, the overseer to Mrs. Prosser, Lochside, Skene, called on me complaining of the behaviour of a yearling quey, which was tormenting, right and left, all the rest of the cattle so indecently that she had to be housed. I found that there was a rudimentary penis, about an inch in length, on the vulva, and that it was almost constantly in a state of erection; and in passing urine, the fluid was squirted right up into the air. On roughly manipulating the udder, which was well developed, I felt a firm body on each side, which I at once recognised as testicles, or tumours of some sort. All the same, I had her cast and secured for their removal, and on cutting right through the posterior glands of the udder on each side, about three inches deep, close on the abdomen, I came upon a couple of well-developed testicles, which I extracted, seemingly complete in every anatomical particular. I put a single suture in each gaping wound, and without anything more ado, the animal was thoroughly cured of its bad behaviour.

REMITTENT ANTHRAX.

BY R. W. BURKE, M.R.C.V.S., ARMY VETERINARY DEPARTMENT, LAHORE.

In accordance with the Adjutant-General's telegram, dated Simla, 16th December, 1886, I left Cawnpore for Meerut on the night of the 19th idem, and after seeing the Inspecting Veterinary Surgeon on my arrival the following day, and being shown round the cases by V.S. (First Class) C. Clayton, A.V.D., began to study the clinical characteristics of a disease which had prevailed in Meerut with undiminished severity since August last. I may mention that I had already examined, previous to my arrival in Meerut, the blood of patients which was forwarded for my opinion from time to time, and pronounced the disease to be Anthrax, an opinion I was afterwards able to corroborate with the progress of my inquiries made on the spot. My stay in Meerut was a little over five weeks. I beg to submit herewith a report of my investigations into the nature of the disease, considered under the following headings :—

Symptoms.—There is always some difficulty in fixing the period of first attack, as animals affected with this disease are seldom noticed ill until the eyes appear dull, with drooping of the eyelids, and petechial spots on the membrana nictitans. In many cases there is a blue colouration of the conjunctiva (cyanosis). If the temperature be now taken, fever is detected. In a few cases shivering fits are remarked at the onset, and the breathing is noticed to be slightly hurried. The shivering may recur in some, though not in all cases, during the course of the disease. In many others in which it was not recorded, I believed it escaped observation. In others again in which it was absent during the early stages, it was sometimes noticed later on. This symptom is, therefore, not of practical value, when we consider the difficulties attending its detection in our animals. The temperature is found to be 102° F., if taken at the onset, and rises to 105°, 106° F., or even higher. It descends in a few hours to 102° F., and may even come down to normal point, *with complete cessation of all febrile symptoms.* The cases linger to several days, and show an apparent improvement, but again manifest acute symptoms, due either to a fresh attack, or, as I think is more likely, to some complication. Usually, the temperature remains at 102° F., or a steady tendency to normal temperature is maintained. Still, the animal does not improve, and the majority of them never do completely rally, being destroyed by order, or succumbing to weakness. Occasionally death results earlier in the course of the disease during an exacerbation. Frequently there is no regularity in the rise and fall of temperature, and the fever often assumes a

remittent type. The temperature sometimes falls below normal point. *There is a morning remission noted in most cases.* In some death follows in a few hours, the animal never having shown any signs of previous illness, but especially towards the early part of the outbreak, as shown by the reports of different veterinary surgeons. In other cases, a sustained high temperature is noticed for four or five days, or more, followed by death. Swellings, due to serous effusion into the subcutaneous tissue, sometimes appear in the course of the disease, but especially under the arms, throat, and abdomen, between the thighs, and in connection with the sheath and scrotum—the scrotum is sometimes enormously enlarged. Thirst is present in some cases, attended with diarhœa. Veterinary Surgeon Ringe saw a case in which persistent vomition was noted. Paraplegia, pronounced Stringhalt, muscular tremors, platting of the legs, etc., develop during the course of the disease, due to effusion on the spine and on individual nerves. These symptoms are seldom permanent in character, and often disappear on removal of the effused fluid due to natural absorption. They may, therefore, be regarded as complications of this disease. Judging from the other symptoms taken in connection, it is not improbable that Paraplegia is but a modification of the paralytic form of Anthrax, well known to veterinarians in India. V.S. (First Class) B. Glover, A.V.D., described to me a case in a stallion belonging to the horse-breeding department, which occurred in this district only the other day, where the animal's tongue hung some inches outside the mouth from swelling (Glossanthrax); *post-mortem* examination revealed the usual lesions of Anthrax, such as have always appeared in my own cases. The rapidity with which the animals lose flesh in this disease is also characteristic of Anthrax, and was well marked in several cases which came under observation, but in none so clearly as in the case of a grasscutter's pony which was found in apparently perfect health and condition at 10.30 a.m. on the 30th December, and had suddenly fallen away by three o'clock of the same afternoon, to the state seen in the accompanying photograph, taken next morning. In a series of more than a hundred temperature charts kept by Messrs. Clayton, Philips, Nuthall, Walker, Ewing, Pease, and others, no relapses have been generally found associated with the fever common to this disease. I have attached a few only, out of many charts kept by myself, and others furnished on request by V.S. Nuthall, which were taken at random from among several cases belonging to the 8th Hussars and 19th Bengal Lancers respectively, and which may prove of interest in this connection.

Course.—The course of the disease is not so rapid as in some other forms of Anthrax, the animals revive after an attack, and a

few days after a relapse occurs, which leaves them so weak that they seldom rally, ultimately succumbing to exhaustion. In these terms Röll has described a form of Anthrax which is noticed on the continent of Europe. (*Lehrbuch der Pathologie und Therapie fur Thierarzte*, 1885.) Bollinger also records cases of Intermittent Anthrax in cattle, in which after each attack the animal appeared in perfect health. And Veterinary Surgeon Bowhill's observations on Anthrax in cattle, may be read with interest in this connection, as showing the characters now and then assumed by this disease in America also. (VETERINARY JOURNAL, December, 1886, p. 418.)

The course and symptoms of the disease are not such as we have been accustomed to meet with during outbreaks of Anthrax in India before; but this should not dampen interest in the subject, and search after truth, whether it be found in accordance with our preconceived ideas or otherwise. The similarity of the symptoms and course observed in the last outbreak among horses and ponies, to those found in Remittent Fever of man, in so far as I can judge from its literature, and the fact of their being indistinguishable from that form of Anthrax known on the continent of Europe as Intermittent Anthrax—*which may easily assume a remittent type in hot climates*—is strong evidence in favour of my belief that the diseases we have studied bear a very near relation to each other, if they are not identical.

Mr. Oliphant, Principal Veterinary Surgeon in India, referring to the Meerut outbreak, in his letter, dated 28th December, 1886, says:—"One of the principal reasons for considering it *not* Anthrax, has been, I understand, that it has not been *rapidly* fatal. But, I believe it has followed exactly the same course as Anthrax in all outbreaks, in which careful observations have been made. Numerous other cases of a prolonged type have always followed." For this distinction we can refer to experiments made on animals, as well as to cases of daily observation. Those conclusions that are based on the observations of rapidly fatal cases *only*, are evidently based on the assumption that the tissues of every animal are absolutely identical. That, however, is not the case. There are some animals which will take the disease in a very virulent type, and die rapidly, whilst in other animals the same micro-organisms will prove relatively innocuous, or produce only a very mild attack, characterised by a prolonged course. It is the same with other diseases; each animal has its own idiosyncrasies for nourishing and for starving micro-organisms, since every nutrient soil is not equally adapted to the same microzoon. But not only is the difference of the same tissue in different animals the reason of a different behaviour of the same microzoon, the tissue itself in one and the same animal may change under different conditions.

It is possible that changes may take place in the system of the animal, unknown perhaps to ourselves, but very important to the respective micro-organisms. I will only allude to "vaccination" as a preventive of disease, which evidently changes the nutrient soil, so that the microzoa of that particular disease can no longer find nourishment, and the vaccinated animals remain unaltered by an injection which would have proved rapidly fatal if non-vaccinated. It is further ascertained, as a matter of observation, that certain micro-organisms cannot thrive well, or do so very imperfectly in one body under certain conditions, whereas they may be pernicious when certain other conditions are present. (Emmerich, *Tageblatt d.* 59, *Versammlung Deutscher Naturforscher und Aerzte*, 18 *bis.*, 24th September, 1886, *p.* 145.) May not this consideration explain why in one animal the microbes of Anthrax produce an acute attack, whilst in another they do not? It is known that, not only in an animal's body, but cultivated in artificial media, bacteria may retain their properties unaltered, or they may undergo more or less modification.

If it is true that not every nutrient soil is equally well adapted to a certain microzoon, that microzoon developing better in one constitution than in another, it must consequently be true that one microzoon may be so changed that it may occasionally show some difference, according to its surrounding conditions, in its mode of growth and other peculiarities, to such an extent that its pathogenic activity might be lessened or strengthened according to those conditions. This idea is in accordance with what daily experience teaches with respects to plants and animals. Plants put in a convenient soil may grow extremely well, and may, to a certain extent, change their colour, smell, and other qualities; but put in a bad and inconvenient soil, they will not thrive, or but only imperfectly.

The P.V.S. in India observes—"I have always been anxious to discover from the charts, whether there is a 'periodicity' in the temperature of Anthrax. There is no doubt that the bacilli appear in crops, appearing and disappearing at varying intervals, and I believe they hold possession of the system, probably in the shape of spores, for very long periods. We have a horse here which has gone through three attacks of Anthrax, and shows now periodical crops of petechiæ on the mucous lining of the eye-lids, etc." An opinion I can fully endorse from my experience of Anthrax in camels also, which I reported officially during 1885-6.

The difficulty which must at first strike every one in regard to the action of these microzoa on the bodies of animals is the comparative rarity of acute symptoms in so many cases. The explanation which on many grounds has recommended itself, as accounting more satisfactorily for the phenomena observed, is that the in-

jurious effects produced by microbes are due, not only to what they take or what they excrete, but what they leave in different cases, and this is closely associated with the imperious demand they make for oxygen. The *bacilli Anthracis* being ærobic, they must obtain the oxygen they require for the process of life from the tissues by which they are surrounded; and when oxygen is withdrawn from such complex compounds as those which occur in the animal's tissues, after an apparent fictitious improvement, the elements enter into new combinations, and then, under the name of ptomaines are believed to be the really poisonous agents. An animal's body is capable of resisting the action of such foreign agents probably better than that of active and living germs, and so long as the poisonous chemical agents do not occur in excess, only partial or modified harm comes from their action. The Principal Veterinary Surgeon in India, in his D.O. dated, Umballa, 21st December, 1886, observes—"Formerly only such cases as died were considered as Anthrax, whilst numerous other cases occurred at the same time, which went unrecognised. Veterinary Surgeon Mann was one of the first, if not the first, to bring this prominently to notice, and in an outbreak here, in N. B. Royal Horse Artillery, last year, in which the most careful taking of temperature of *all* horses was carried out, only a comparatively *small* percentage of deaths occurred, and these principally in the beginning. In the late outbreaks at Rawulpindee and Multan, the nature of the disease was clearly set at rest by demonstration of the *bacillus Anthracis*, under the microscope."

(*To be continued.*)

Editorial.

VETERINARY EDUCATION.

THE commencement of the winter session of the veterinary schools seems to be a fitting time to direct attention once again to the perennial, and always important, subject of veterinary education. And it is all the more necessary, perhaps, to refer to it now, when very radical changes may be shortly proposed in the manner of testing whether candidates for the diploma of the Royal College of Veterinary Surgeons are really what that document vouches its possessors should be. For it testifies that he whose name is inscribed upon it has been examined by the Board of Examiners of the Royal College, and has been found *fully qualified to practise the art and science of veterinary surgery and medicine*, and that this award constitutes him a member of the profession.

It will be at once seen that, by the terms of the diploma, the newly-graduated veterinary surgeon is certified to be competent to assume and carry out in a skilful and satisfactory manner all the demands which a most exacting public may make upon him as a professional man.

Without discussing whether the testimony of the diploma is not highly exaggerated, and therefore misleading, as to the knowledge and ability of the student who successfully passes the final examination of the Royal College, it may be well to note that in recent years the student has gained advantages in passing the tests of the Examining Board which his predecessors certainly had not. For instance, to obtain the diploma he now has three examinations, while before there was only one; and a student rejected then had to wait a year before he could be re-examined, while now he may appear in three months. True, some subjects have been added—pathology, histology, and morbid anatomy; but the tendency has been to make the course of study and the examinations easier for the student, by extending the former over a longer time, and making the latter more frequent, while dividing them into three sections. It is about to be proposed, we believe, to make the examinations still more easy, by exempting a rejected student from re-examination in those subjects in which he has already chanced to pass.

For instance, in each of the three divisions of examination there are three subjects; a student who comes up to be tested in one of these divisions may fail in one or two of the subjects, and pass in two or one; when he comes up again he is not to be examined on the latter. To this proposal there is the gravest objection. A lazy or stupid student, even the veriest dolt, has a chance of obtaining his diploma by passing in only one subject at each examination; and though the process may be a slow and an expensive one, it will be submitted to, and thus men will be passed into the profession—squeezed through by infinitesimal instalments—who have not the intelligence or application fit for a professional life. Nay, what will probably be proposed for the final examination will be even more damaging. The student who has passed in the oral, but failed in the practical, portion will not be

examined again in the former; and to acquire the latter he may further spend his time at the college, or go to a practitioner. This proposal will emanate in all likelihood from the quarter which strenuously opposed, and got three outside corporations to oppose, the clause in a recent charter applied for by the Royal College, to the effect that a student before undergoing his *final* examination shall serve a pupilage of twelve months with a qualified veterinary surgeon—a quarter which has over and over again asserted publicly that practitioners could not teach practice, that they could not be entrusted with the care of young men, and that the knowledge these obtained as pupils was worse than useless. Now, when it has discovered that students who go up for their final examination are woefully ignorant of practical knowledge—so ignorant, in fact, that one teacher asserts they should not be expected to have any, but should endeavour to acquire it after they have left the schools, and when possessing a diploma certifying they are fully qualified to practice—and that one half are relegated to further study, the much-abused practitioners are to come to the rescue of the schools.

The real fact is, the schools cannot impart the necessary amount of practical knowledge which the holder of a diploma should possess; they have not the conveniences or opportunities. Even in the medical profession, notwithstanding the immense facilities and advantages the hospitals offer for practical instruction, grave complaints are made as to the lack of such knowlege on the part of young doctors, and many of the leaders in medicine are urging a return to pupilage, in order to render junior medical men more useful and trustworthy when they leave their schools. One of the most glaring defects in our system of veterinary education in this country, is the absence of even the most elementary practical training—a defect which the expunged clause referred to would have gone far to make good. But it must be remembered that the schools have contracted with the students to teach them their profession for the fees they exact, and they have no right to send them wandering abroad in search of instruction. Upon the practical and scientific skill of the veterinary profession hinges its existence; and certainly the first, the most difficult to acquire, is that which is least cared or provided for in the instruction of students. It is the lack of practical knowledge which brings the younger members of the profession into disgrace, though the fault is not theirs.

With regard to the examinations, then, our opinion is that they are already too easily got through; and to make them easier by deciding that once a student has passed in a given subject he is not again to be examined upon it, is an acknowledgment that he was only crammed in it for the occasion, and has forgotten all about it. The profession and the public ask for a gallon, but some of the teachers say they must be satisfied with a quart, or take their gallon by instalments, and possibly in very short measure; or they would try to cram the gallon into a quart pot. The profession is already full to overflowing, and the struggle for existence among its members is becoming serious; all the more reason, therefore, for keeping dolts and dullards—such as the new proposals would admit—out of it. We have too much in quantity, we require

more in quality, and if the profession is alive to its interests it will insist upon this.

Changes in the Examining Board (with the view, we suspect, of rendering the examinations easier and the number of passes greater) are also contemplated. One of these is reversion to the old and most objectionable system of having what are called "specialists" as examiners —that is, men belonging to other professions who know nothing of ours or its requirements, and who care as little. Surely the profession will not have the conscience to confess that it cannot examine its own students, and that it is no more advanced now than it was ninety years ago! There is much talk about spreading the honours pertaining to the Royal College among its members, and this will be commenced by employing aliens as examiners. If there is any honour in being an examiner—which recent events leads us very much to doubt—then that honour should most certainly be retained among ourselves.

The Fellowship degree was instituted with the view of encouraging members to become examiners, and this is one of the inducements held out to them to study and pay fees; if medical men and other outsiders are to step in and filch this privilege from them, then assuredly it will be a breach of the understanding, and a disgrace to boot. There are men in the ranks of the profession quite as competent to examine as to teach in every branch of veterinary knowledge; and though they may, for the sake of their calling, be less inclined to pass incompetent men than the so-called "specialists," they are certainly the men who should be the examiners of veterinary students, as upon them we can place reliance, and upon them we have influence and powers of direction. Not so with the aliens.

The Royal College exists solely for the promotion of veterinary education and veterinary science. On behalf of the public it assumes very serious and onerous responsibilities, and upon the manner in which it discharges its duties will its prosperity depend. Hitherto it has faithfully carried on its functions; but in order that it may continue to do so, there must not be instituted a process of lowering the manner and standard of examinations to the capacity of the dullest or idlest students, but rather a raising of them in thoroughness and severity, so as to admit none to membership but those whose training and intelligence truly deserve the testimony of the diploma as at present bestowed.

CATTLE PLAGUE IN THE PIG.

ALL writers on Cattle Plague are unanimous in stating that ruminants alone are susceptible. Mr. Penning, Veterinary Surgeon to the Government of the Netherlands, East Indies, has clearly demonstrated the susceptibility of the wild hog of Sumatra to Cattle Plague. Having remarked with his colleague, Klein, that the numbers of wild pigs decreased after every outbreak of Cattle Plague in the island, he resolved to prove by experiment if they did not die from the same affection as the cattle did.

Having caught a wild pig, he kept it for fifteen days to be certain that it was healthy, when he placed it with the body of a calf that had died of Cattle

Plague. The pig ate some of the carcase, and five days afterwards was noticed to be ill; the sixth day remaining constantly lying down, refusing food, with a discharge from the nose and eyes; the seventh day the pig was unable to get up, the secretion from the eyes was very abundant, and the conjunctiva deeply injected; the eighth day there was an abundant diarrhœa, the injection of the conjunctiva increased, the lachrymal secretion was purulent, and there was difficulty in breathing; on the ninth day the animal died. *Post-mortem* examination showed the mucous membrane, from the mouth to the anus, more or less congested and covered with petechiæ. The respiratory mucous membrane showed the same lesions, clearly proving that the pig died from Cattle Plague. In conclusion, Mr. Penning remarks, this proves that, in the Island of Sumatra, at all events, pigs are attacked with Cattle Plague, and that it is no longer to be looked upon as exclusively confined to ruminants.

SWINE FEVER.

In view of the diversity of scientific opinion as to the nature of Swine Plague or Fever, and whether two distinct diseases are not really included in this designation, the German Government has sent Dr. Schütz, the professor of pathology at the Berlin Veterinary School, a favourite student of Professor Virchow, and one of the foremost pathologists in Germany, to study the malady in this country, and to ascertain if the disorder known as the "Schweineseuche" is the same as our Swine Plague.

We believe that, so far as his investigations have gone, he is of opinion that they and the Hog Cholera of the United States of America are one and the same disease, which is special to the pig, but that another malady of an anthracoid nature, the "Rothlauf" of the Germans, "Rouget" of the French, "Red Soldier" of the English, is often confounded with it. This is the disease which, though termed "Swine Fever" in this country, is characterised by skin eruption.

We shall look forward with interest to the professor's report, as it will probably add to the information which he has already given us with regard to this porcine scourge. Schütz' name will be familiar to our readers as the discoverer, with Löffler, of the Glander bacillus.

THE GLANDER BACILLUS.

In the *Centralblatt für Bacteriologie* (vol. ii., No. 10), Dr. Krauzfeld gives the results of his recent investigations upon Glanders at the Odessa Bacteriological Institute. He first availed himself of material afforded by nodules removed from a case of acute human Glanders ten hours after death. Cover-glass preparations of these nodules contained a large number of bacilli. Small portions from the centre of the nodule were introduced into the peritoneal cavity of two guinea-pigs. One of these animals presented marked infiltration at the seat of inoculation on the fourth day, and swelling of the left testis on the seventh day; it died on the fourteenth day. A greyish ulcer with infiltrated margins occupied the seat of inoculation; the left testis was replaced by a caseous abscess, and the spleen contained numerous yellowish-grey nodules. The pus from these parts and the nodules of the spleen contained numerous bacilli, the ulcer yielding also various micrococci. Cultures on serum, agar-agar peptone, potato, and agar-agar peptone with glycerine, were made. The growth of the bacilli on blood-serum and potatoes corresponded to the description given by Löffler. The glycerine agar-agar cultures were the best, whitish streaks appearing at the point of inoculation on the second day, reaching seven or eight millimetres in width by the sixth to the eighth day. The bacilli had the characteristic shape, with rounded ends, as described

by Löffler. In the older cultures, some thicker, less regular rods, which stained badly, were thought to be involution forms of the bacilli. No spores were found; thus confirming Löffler's surmise that the bodies described by Weichelselbaum as spores are due to the death of the bacillus. In a series of inoculations in guinea-pigs, carried through several generations, the characteristic disease of the testis, nodules in the spleen, and in some cases disease of the nose, were present. No other internal organ besides the spleen was found to be affected.

A case is given in which a diagnosis of Glanders was made by bacteriology. Some nasal secretion from a horse supposed to be glandered, but with no clinical facts in support, was sent to the Institute for examination. Guinea-pigs were inoculated with the material, and died in due course with the above lesions. Examination of the pus and the splenic nodules showed the characteristic bacilli, which were also obtained by cultures. A *post-mortem* examination of the horse confirmed the diagnosis thus arrived at; it proved to be a well-marked case of pulmonary and nasal Glanders.

THE HORSE.

A HISTORICAL SKETCH BY DR. E. W. SEYTTER. REVISED BY DR. A. GRESSWELL, M.B., OXON. (COPYRIGHT).

As far back as history, legend, or myth lead us into the dusky epochs of primeval existence, we find the horse mentioned.

Eighteen centuries before Christ it was known to the Babylonians as an animal whose domestication was already then lost in the mist of ages, as a stone tablet, found by G. Smith among the ruins of the Assyrian city of Kounyoundjik, tells us.

On another similar tablet of not much more recent date, written in the reign of a certain king Assur-bani-pal, there is a fable of *the horse and the ox* entering into terms of friendship. The horse is always called the "*glorious in war.*"

The writer of the Book of Job has bequeathed to us one of the finest characteristics of the warhorse, couched in the glowing language of eastern metaphor. "Hast thou given the horse strength? Hast thou clothed his neck with thunder? Canst thou make him afraid as a grasshopper? The glory of his nostrils is terrible!" etc., etc.

In the Rigvêda, *i.e.*, one of the sacred books of the Hindoos, the horse is mentioned as being in the service of man, and in the "Iliad" of Homer it is repeatedly alluded to.

Before we proceed further in describing the position of the horse in the life and history of mankind, it will not be uninteresting to submit some of its different names to a closer examination.

The English word *horse* is derived from the form *hors*, used by the old Anglo-Saxons before the Norman Conquest, which is the same as the Icelandic *hors* or *hross*. This word *hors*, *hross*, or *horse* is found, with very slight modifications, in most of the Teutonic languages. Thus we find *ros* in Dutch, and *ross* in German.

All these similar words come from an old syllable *hor* or *har*, with the meaning of *running* or *moving swiftly*.

There was another word in the language of the Anglo-Saxons, *i.e.*, *horse*, which means *swift, quick*. From this word is derived our English *rash* and the German *rasch*, both expressing the idea of being *swift of action* or *thought*.

We therefore see that to the Teutonic race the horse was the animal whose principal characteristic was its fleetness.

The same idea occurs in various other languages both of Europe and Asia The Greeks called the horse *hippos* (*hikfos*), and the Latins, with a different pronunciation, said *equus* (*eqvus*). Among the old Persians the name of the horse was *açpa* and *asp*, and in the Gaelic language it was called *epos*. The Armenians still say *asb* for horse, and the old Lithuanians, a people that lived once along the shores of the Baltic Sea, used *aszwà*, which is only a different form of the word *aihvus*, which was used by the ancient Goths. In the ancient language of India, such as is found in the sacred books of the Hindoos, *açva* means equally a horse, *âçus* swift, and *açan* a dart or the swiftly flying weapon.

Aquila, which means an eagle in Latin, is the *swift flyer*, and *aqua* stands for the quickly running waves of the water and for water itself. With slight changes we find the same word also in the Keltic language as *achi*.

The connection between the two words *aqua* and *equus* is, as will be shown presently, of great importance for the horse as a mythological figure.

The question arises now, What do all these different names tell us? This question we will endeavour to answer in the following lines.

Any one examining the written records of all the nations of the ancient civilisation in the old world in a direction from west to east, finds that the more he advances eastward the more the date of the first appearance of the horse as a domestic animal is gliding back into the dusky times of the past, until it finally vanishes altogether from out of the memory of mankind into the uncertain regions of myth.

Another observation, going parallel with the above, is the fact that all the names of the horse, bequeathed to us by the ancient races of mankind, belong to the same stock of languages. No vestiges of an ancient name for the horse can be traced either in the great empires of the Nile, Egypt, and Meroë, or in the records of the Israelites, the Phœnicians, the Syrians, and the Arabs.

But it is not only going from west to east that the date of the domestication of the horse is removed back in time; the same phenomenon occurs when we traverse India in a direction from south to north, or again China and Mandshuria from east to west.

We obtain thus three different lines or radii beginning respectively in Western Europe—let us say on the west coast of Ireland, in the south of India, and on the east coast of Asia, and all running into one central point in the great steppe of Shamo or Gobi, in inner Asia. There must have been the first home of the domesticated horse, and from thence it has spread in concentric circles, and at different epochs, over the whole earth.

On the boundless and dreary steppes of Central Asia there still lives a wild horse call the *Tarpan*, which is according to all indications the ancestor of our domestic horse. Darting with flying mane and flashing eye across the wide space of the steppe, the tarpan is to the savage nomad inhabiting those countries an image of all that is free, unfettered, and swift, fierce, agile, and independent. Therefore he has called it the *swift one*, and his descendants in civilized Europe call it still so, though it be tied to the cart, and the plough, and its lofty and savage spirit be broken by slavedom.

The swiftness of the horse of the steppe is the more remarkable if compared with the grotesque and heavy-looking, wearily moving camel of Bactriana, with the peaceful and slow ox, or the timid and shy sheep. Even the dog, that faithful and intelligent friend of man, is but a poor creature in these countries when compared with the horse.

There are tribes, roving over the wild plains of Asia, whose entire life is dependent on the horse, and that would meet with certain extinction were that animal ever to be withdrawn from them by nature.

The child of the Tartar is tied on its father's horse and taught to ride before its legs are strong enough to enable him to walk. When grown up he

eats, and even often sleeps on horseback. Herodianus, an old writer, says, of one of those tribes of wild horsemen, the Parthians:—"They use their bows and horses not only for the purposes of war like the Romans, but grow up with them from their earliest childhood; they never put their quivers aside, neither do they dismount their horses, but always use them either against their enemies or the wild beasts."

In the valleys and deserts of the rivers Oxus and Jaxartes is found the Turkmenian horse, highly esteemed for its strength, endurance, and intelligence. With a small amount of food the Turkmene rides scores of miles over the waterless plains without resting once, surprises, robs, and disappears ere the victim knows almost what has happened to him. For those qualities and services, the rider loves his horse more than his wife and children, and cares for its welfare in the most touching manner. To the Kirghiz the horse is the quintessence of strength and beauty. "He loves his horse more than his sweetheart," says a modern traveller, "and fine horses seduce even the most honest and honoured man to stealing."

The best horses of antiquity were those of Media and Persia, and the Medes and Persians were known throughout the whole of the ancient world as skilful horsemen.

Herodotus speaks of the celebrated Nisæan horses:—"In Media there is a wide plain, whose name is *Nisaion*. This plain produces the great horses called after it;" and another Greek writer, the geographer Strabo, calls the Nisæan horses the best and greatest horses used by the kings of Persia. Armenia was another country celebrated for its excellent breed of horses, as we learn from the same author. "Armenia is so blessed with horses that it equals Media in this respect . . . . The Satrap of Armenia sends the king of Persia every year 20,000 young horses for the festival of Mithras."

Mithras being the sun-god of the ancient Persians, this leads us to the horse as sacred to solar deities among various nations.

The sun, moving quickly across the cloudless skies of the steppes of Central Asia, the Persians, Medes, Massagetes, Alanes, and numerous other tribes consecrated the horse to their sun-gods. This we learn already from the "father of history":—

"They (the Massagetes) worship the sun as their god, and sacrifice horses to him. The meaning of this is that to the swiftest of all gods they sacrifice the swiftest of all earthly creatures."

Homer calls the sun by the epithet, "*never-tired*."

In the Rigvêda of the Hindoos, we read the following lines about the horses of the sun-god:—

"See Surja's blessed yellow coursers,
The praiseworthy and glittering in colours,
Rise worshipping on heaven's sphere,
Round heav'n and earth they turn within a day.

"This is the godhead of Surja, his greatness:
When all in action, he doth loose the team,
And when he from the chariot takes the yellow horses,
Still night is covering everything with darkness.

"And then, before the eyes of Mithras and Varunas,
Surja assumes his form in heavenly regions,
In endless train his red and dusky glory
Is led thus by his yellow coursers."

The same idea of the sun-god riding on his chariot was prevalent among the Greeks.

Castor and Pollux, the two gods of light, are represented as riding on white horses, or standing on chariots drawn by them. Thus they appeared in the battle on the River Sagra, in which the Locri were, by their help, victorious

over the men of Crotona. White horses were said, in the metaphorical language of antiquity, to have been wedded to the fair and beautiful daughters of Leukippos, whose name reveals the element of light. *Eos*, the rising sun, appears in the eastern skies on white horses chasing the sombre night before his radiant appearance, and the Lacedæmonians sacrificed white horses to Helios on Mount Taygetus. This god was represented as being drawn by white horses, beaming in silvery radiance.

A white horse was sacred to *Svatovit*, the Slavonian god of light, and *Triglav*, the demon of night and wickedness, *Svatovit's* antagonist, rides on a black steed.

Of the ancient Saxons we know that they consecrated their white horses to the sun, a custom which has the same origin as the sun-worship of ancient Persia, where Darius obtained the royal crown because his horse neighed first to the rising sun.

The kings and heroes of the ancient world being regarded as the earthly representatives of the heavenly powers, they very often assumed the divine symbols as their own emblems.

The citizens of Agrigentum, in Sicily, went out of their city with three hundred chariots, drawn by white horses, to meet the victorious hero Exænetus; and the dictator Camillus, after having captured the proud city of Veji, entered Rome on a chariot drawn by white horses.

Not only the golden sun, but also the rapid storm was represented by the horse, as was also the swiftly flowing water.

The horses of Boreas, the god of storms, form an important feature in Greek mythology. In the "Iliad" of Homer we read how the twelve foals of Boreas:

> ". . . . o'er the teeming cornfields as they flew,
> Skimmed o'er the standing ears, nor broke the haulm;
> And o'er wide Ocean's bosom as they flew,
> Skimmed o'er the topmost spray of the hoary sea," etc.

When the Greeks wished to give a good description of a fine horse, they likened it to the storm or the breeze. Thus "the horses of Rhesus were in their swiftness like the winds,"—those of Achilles were called the sons of Zephyr, and the Harpy *Podarge*, whose own name means "*the swift-footed*," possessed horses that flew with the gust of the wind, of which Xanthus, one of them, boasts:—

> "Our speed of foot may vie with Zephyr's breeze,
> Deemed swiftest of the winds. . . . ."

Æolus, the ruler of the winds, is himself a son of *Hippotes*, *i.e.*, the horseman.

In the magic and mysterious twilight of Scandinavian mythology, the horse is the servant of various gods.

Odin, the god of the fleeting, ever-moving, either stormy or serene element of the air and the sky; *Wuodan*, the mighty lord of the wild chase of the German folklore, who at the head of a spectral host rushes on his horse through the green leaves and over the still moonlit clearances of the fores' solitude—*Wuodan*, whose name we still possess in our Wednesday, *i.e.*, Wuodansday, possesses a giant horse with eight feet, grey of colour like the mist and the fog, and the stormy air of midnight, *Sleipnir* by name.

Winter, the giant, promises the gods of *Völpusheim*, *i.e.*, the Scandinavian Olympus, to build them a beautiful palace, in which undertaking he is helped by his horse, *Svadilfari*, or the *Northwind*. Before the palace is completed, however, *Loki*, the cunning and crafty, assumes the form of a *steed* (Southwind), and thus draws *Svadilfari's* attention from the palace, which thus remains unfinished when gay spring enters the land. *Thor*, the terrible thunderer, dashes the head of the giant to pieces with his magic hammer.

As a symbol of water, we find the horse in the beliefs of various nations.

The ancient Persians killed horses in honour of the rivers; thus when Xerxes came to the river *Strymon*, the Magi sacrificed white horses to the genius of that river.

In the reign of the Emperor Tiberius, the Parthian Tiridates propitiated the river-god of the Euphrates by the sacrifice of a horse.

The same rite prevailed among the old Trojans, who threw live horses into the waters of the river Skamandros, if we are to believe the hero Achilles, who tells us how:

" . . . . living horses in his waters sink."

On the Argivian coast, in Greece, there once used to spring forth a well of fresh water amid the salty waves of the sea. Into this spring, which was called *Dine*, the Argivians used to precipitate caparisoned horses as a sacrifice to Poseidon, the god of the sea.

In the Island of Rhodes they threw even whole chariots with their teams, all beautifully adorned and harnessed, and consecrated to Poseidon, into the sea.

The waves of the ocean, sweeping gently over a sandy shore, or dashing fiercely against steep and wild rocks, were from oldest times compared with horses, and he who will watch the continuous, never-tiring game of the revolving waves with their crests of foam, like white silvery manes, and curved like the neck of a spirited horse, now sinking, now rising, will surely support us when we say that no better metaphor could possibly be found than that of the *horses of Poseidon*.

Whenever we meet with the horse among the ancient nations, it is always in the capacity of a warlike animal that it presents itself to us. The use of the horse in the peaceful pursuits of everyday life was unknown to the primitive civilisation. It either drew the war-chariot or bore the saddle (although the art of riding is of much more recent date than that of driving), but it was never found before the plough or the cart.

For the tilling of the ground and the ordinary traffic the ox was used.

"First of all a house, and a wife, and a ploughing ox."

These three are, according to Hesiodus, required for a rustic home, but he does not add the horse. He who had no oxen or cart had to go and borrow them of his neighbour, but,

"Easily sayest thou; Lend me two oxen, friend, and the chariot.
But easy, too, the refusal; The oxen are out at the work."

The life of the ox as the support of man's existence was sacred, like the life of his master. Pythagoras said,—"*Lay not thy hand to the ploughing beast.*"

In the fable of *Cleobis* and *Biton*, which Solon tells king Croesus, it is said that the priestess of Hera drove on an oxen-cart to her temple. The old Merovingian kings went to the assembly of the people on carts drawn by oxen, and in the Salic Law the killing of the *taurus regis*, or ox of the king, was punished by a much higher fine than that of the king's finest horse (*varrannio regis*).

No such pretexts and laws existed in favour of the horse, which, as an animal sacred to the war-god, and to solar deities, was either slaughtered on the altars of the temples or fell in battle.

Riding was an unknown art among the ancients. On the ruins of the royal cities of Babylonia, Assyria, and Media, the horse is always represented as drawing the chariot, but never as carrying a rider.

In the "Iliad" we read that:—

"In the front rank, with chariot and with horse,
He [Nestor] placed the car-borne warriors; in the rear,
Numerous and brave, a cloud of infantry,
Compactly massed, to stem the tide of war."

Only in a more recent period we meet with the horse bearing the saddle, as, for instance, in early Rome, whose cavalry was famous, and whose knights, the *equites*, derived their name from the horse (*equus*). Thus Aulus, the Roman dictator,

"Spake to Caius Cossus,
The captain of his guard;
* * *
Now hearken, Caius Cossus:
Spring on thy horse's back;
Ride as the wolves of Apennine
Were all upon thy track."

As time wore on, however, and the dim glimmer of the heroic ages waned away before the broad and sunny light of civilisation and humanity, when war and hunting ceased to be the only pursuits of mankind, and agriculture and industry took their stead, the horse was used more and more for domestic purposes. Like the ox it began now to draw the plough through the furrow or the peaceful cart to the market of the primitive city. As a servant of war it remained only in the feudal institutions of the Middle Ages, and the orders of chivalry would certainly never have arisen without the steed of the warrior. At the present day its use in war is far eclipsed by its importance in the works of peace.

To us, inhabitants of Europe, and citizens of the nineteenth century, the horse only yields its intelligence and bodily strength; but among various tribes of Central Asia, the Tartars, the Calmucks, the Mongols, also the Turks and Huns in times of old, the milk and the flesh of the horse were and are still the main support of their existence.

Cumiss, i.e., fermented horse's milk, is deemed to be the finest drink among the wild horsemen of the great Shamo in the heart of Asia. By such savage tribes of Turanian origin the custom of drinking the milk of horses was introduced among the old Slavonian populations—the Russians, the ancient Prussians, and the old inhabitants of the Baltic provinces of Russia. An old writer says of the ancient Prussians, "They possess so much honey that the king and the rich people leave the mead to the poor and the serfs, and drink the milk of steeds."

Here, as among the ancient Medes and Persians, the steeds were kept in herds like cows, and were regularly milked. The Goths in Sweden, and the Sembes—a people inhabiting the country of Samland, intoxicated themselves with the fermented milk of horses.

Eating horse-flesh was a chief characteristic of the old invaders of Northern and Central Europe, and the dismal, yellow hordes of the Huns, which invaded and laid waste the countries on the Danube and the whole of the German Empire at the beginning of the Middle Ages, used to put a piece of raw horse-flesh under their saddles and ride on it until it was soft enough to be devoured.

Horse-flesh cooked was in ancient times a favourite dish in Germany, and even the pious inhabitants of convents and cloisters enjoyed a joint of horse, and very thankful they were for it, as may be inferred from the Latin blessing in use at about 1000 A.D. among the monks of the rich convent of St. Gall in Switzerland:—"Sit feralis equi caro dulcis in hac cruce Christi."

Pope Gregory III. wrote in the year 732 to Winfried Bonifacius—a Briton, and the great missionary and martyr of the north, called the apostle of the Germans—"Thou hast permitted to some the eating of the flesh of wild

horses, and to most that of tame horses; henceforth, most holy brother, do not permit it any more."

It seems that the great British missionary had been lenient in this point. Most probably to him, who had known the use of the flesh of the horse in his youth, the practice was a natural one, and he did not look on it with horror like the Pope, who was a child of the south, where people were always more particular and discriminate in matters of animal food than in the north.

Before we close this sketch by a brief history of the horse in England, we intend to take into consideration the two nations of ancient Egypt and of the Israelites in their relations to that animal.

In the so-called ancient empire of Egypt, that is, from the beginnings of history to about 2000 B.C., no mention whatever is made of the horse, either in the written records or on the pictorial representations.

Only after the time when the great invasion of the Hyksos or Shepherd tribes in Egypt was past (about 1700 B.C.) we find the horse mentioned in the picture-writings of that wondrous country. Probably it was introduced in Egypt by the Hyksos. At any rate, it came there from the east, and soon after its introduction became one of the most conspicuous features of the country.

From Egypt it penetrated into Palestine, where it had been unknown before.

Scarcely any mention is made of the horse in the olden times of Israel, and where it occurs it is only as the warlike animal that forms the proud and insolent boast of the mighty and rich nations surrounding the humble and righteous people of the Lord. The patriarchs never used it for their own mostly peaceful purposes, nor does it seem to have taken any part in the wanderings and struggles of the Twelve Tribes before and during their establishment in Palestine.

The ass and the mule were the only animals in use for riding and driving.

The Decalogue says: "Thou shalt not covet thy neighbour's wife, nor his ox, nor his ass," etc., and never mentions the horse—a clear proof that it was not an inhabitant of Canaan at the time of the Israelitic conquest.

In the former days of Israel and Judah, the horse was even an abomination, as being the animal sacred to "strange gods": "And Josias took away the horses that the kings of Judah had given to the sun at the entering in of the house of the Lord . . . . . and burnt the chariots of the sun with fire" (2 Kings xxiii. 11).

These horses and chariots were evidently the emblems of some eastern solar deity, perhaps Median or Assyrian.

The armies of the heathens possessed horses and chariots:—"And they [the Canaanites] went out, they and all their hosts with them. . . . . with horses and chariots very many" (Josh. xi. 4). "Then were the horsehoofs broken by the means of the pransings" (Judg. v. 22).

As the proud, lofty, and defiant animal of the mighty powers it is mentioned in the Book of Job.

These prejudices against the animal disappeared in the course of time, and in the reign of King Solomon the kingdom of Israel was so reconciled with the horse that a lively traffic was carried on with Egypt.

The Arab horse, now so high in praise, is also a comparatively recent importation from the East.

The Arabs of the primitive times did not know the use of the horse, in whose strength and swiftness consisted the might of their enemies; they used the dromedary instead.

"In *Arabia Felix*" (now the province of Yemen in Arabia), says the geographer Strabo, "there are neither horses nor mules to be found; their places are taken by camels."

The Arab warriors in the army of Xerxes, and at a later period in that of Antiochus the Great, rode exclusively on dromedaries.

Now the Arab horse is one of the finest animals of creation, and the most precious jewel in the possessions of an Arab, who, like the Tartar and the Khirghiz, loves it more than his family and himself. An anecdote may serve to illustrate the Arab's love for his horse:—

"The whole stock of an Arab of the desert consisted of a mare. The French consul offered to purchase her, in order to send her to his sovereign, Louis XIV. The Arab would have rejected the proposal, but he was miserably poor; he had scarcely a rag to cover him, and his wife and children were starving. The sum offered was great; it would provide him and his family with food for life. At length, and reluctantly, he yielded. He brought the mare to the dwelling of the consul, dismounted, and stood leaning upon her. He looked now at the gold and then at his favourite. What he said and to what conclusion he came may be quoted with the poem:—

"'My beautiful! my beautiful!
That standest meekly by,
With thy proudly arched and glossy neck,
And wild and fiery eye.
Who said that I had given thee up?
Who said that I had sold?
'Tis false! 'tis false, my Arab steed!
I'll fling them back their gold.'

With the last words he sprang upon her back, and was presently out of sight."

To this proud animal of the sandy desert the splendid Spanish horse owes his excellence, and both the Spanish and the Arab horse have endowed the English racer and hunter with their fine qualities. The thoroughbreds of England are, without exception, descended from one or the other of the above horses.

The first writer who mentions British horses was Cæsar, who praises them as "powerful, and well-suited for purposes of war by their stature and training." Figures of horses frequently occur on ancient British coins—a fact well worthy of attention, as it bears proof to the importance of the horse in those times.

After the invasion of Britain by the Angles, Jutes, and Saxons, the rearing and training of horses rose into sudden eminence, and the horses of that period belonged to the best in Europe.

The saddle was in use as early as the first part of the seventh century. The old ballad of the Battle of Maldon says of Goderic that "he fled from the field on the horse which his master had ridden in battle."

German and Spanish horses were introduced in Britain under the reign of Athelstan, and improved the breed greatly.

William the Conqueror owed his victory at Hastings chiefly to the superiority of his Norman cavalry, and after his ascension to the English throne he paid every attention to the rearing of horses. It was in his reign that the Earl of Shrewsbury, Roger de Belesme, imported some fine Spanish horses to improve the studs on his estates in Wales. He succeeded so well in his endeavours that the horses from that part of Wales were for a long time afterwards celebrated for their swiftness.

The English draught-horse was improved by a hundred Flemish stallions, introduced by King John.

Spanish and Arab mares and stallions were brought into England under Edward III.

In the time previous to the Restoration, the prize for the winner in the great races consisted of a silver bell. This bell was converted by Charles II.

into the cup that now forms the highest ambition of the owner and the rider of the race-horse.

Constant care and steady improvement have raised the English race-horse to such a high level that it not only vies, but actually beats the splendid Arab courser, both in speed and endurance, and thus forms a manifest proof of what the intelligence of man is able to perform, as respects the rest of the animated creation.

The Tarpan and the savage horseman of the steppes of Central Asia, and the beautiful, proud, and aristocratic animal, together with man as representative of Western civilisation and refinement—these are the two poles, between which the great fact of the civilisation of Europe and Asia has been accomplished.

It was the horse that bore the countless hosts of Aryan settlers from the heart of Asia right across two continents to the Ultima Thule of the ancient world; without it, the great immigration would never have risen as a fact into history.

It was the horse that formed one of the principal bases of the whole of the mediæval state and society. Feudalism without chivalry was a thing impossible, and a knight without a horse is inconceivable.

Wherever we look we meet with the horse—in war and in peace, before the plough of the settler or under the saddle of the nomad. Considering and summing up all the facts and details, we might well ask ourselves, Would Europe ever have received the precious gift of an early civilisation without that most faithful of all animals?

SOME FIRST PRINCIPLES OF SCIENCE.*

MR. PRESIDENT, LADIES AND GENTLEMEN,—When you kindly invited me to deliver a lecture this evening before the members of your learned society, I felt myself much honoured by your courtesy and consideration. My only difficulty was in the selection of a subject which would at once be likely to prove of the most interest and, at the same time, of the greatest usefulness, for I may say that I most fully sympathise with the praiseworthy objects at which you aim. Hence I determined to select a wide range of scientific review for our mutual consideration.

It is true of most scientific knowledge—it certainly is, in the highest sense, of medicine and the science of disease—that the facts recorded in books are not up to the level, or anything like up to the level, of the knowledge possessed by the foremost workers. It concerns us not to-night to say why this is so; but it does follow, as a corollary from this truth, that the function of the lecturer is, if possible and where possible, to bring forward facts which one cannot readily find recorded—new truths which have not received the attention they deserve. In recent times Bacon's prophecies regarding the advance of science have indeed been fulfilled far beyond what even he could have imagined; and every day our knowledge grows. Every day the physician who makes it his aim to keep abreast of the wonderfully important and most valuable work which is now being done in England, on the Continent of Europe, in America—in short, all over the earth where civilised people dwell—is acquiring new powers hitherto undreamt of in dealing with the ills to which human flesh is heir.

Ladies and gentlemen, it is Thought which has always ruled and ever must

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* A lecture delivered by Dr. Albert Gresswell, B.M., B.A., M.R.C.S., Christ Church, Oxford, in accordance with the invitation of the Louth Naturalists' Society, before that society, on Thursday evening, May 5th.

rule the world in which we live. It is this which determines all our activities, tells us what to investigate, how to investigate, how to apply the results of investigation. Yet Thought, though it has always had a deep soul of Truth, has yet not been ever quite accurate, and this we see in the accounts of the supposed origin of the earth which different nations have believed. According to the Babylonian belief, there was a time when all was water and darkness. Then from these came hideous creatures, winged men, men with the legs and horns of goats, bulls with human heads, and other like monsters. Above all these was a woman, goddess of nature and mother of all beings; and Belus, the chief of the gods, cut her in two, making of one half the earth and of the other half the sky. This caused the monsters to die, for they could not bear the light, upon seeing which, Belus cut off his own head, and the gods then mixed the blood that flowed therefrom with the dust of the earth and formed man; and this accounted (so thought the Babylonians) for man's divine nature. Belus afterwards made the sun, moon, stars, and five planets.

In the ancient religion of the Egyptians there is a legend that the Sun wounded himself, and that from the stream of his blood he created all beings. According to the Hindu legend, the universe was in darkness when Brahma, himself unseen, dispelled the gloom, producing the waters and causing them to move.

These and many allied beliefs, indicating as they do an ever-yearning search for an explanation of the facts of the universe in the minds of primitive races, are of intense and ever-living interest. The love of truth, implanted by the Almighty in the mind of man, ever spurred on, even in the oldest times, to answer those great questions, "Why are we here? What is the nature of that great mystery which our presence here and the existence of the universe around us present to our inquiring minds?" It will be manifest to those who have studied the early beliefs of mankind that there are great and striking resemblances between them.

The story is well known, writes Edward Clodd, how, in the 1307th year after Christ, the cruel Gessler set a hat upon a pole as a symbol of the ruling power, and ordered every one who passed by to bow before it. A mountaineer named William Tell refused to obey his behest, and was at once brought before Gessler. Tell was known to be an expert archer, and he was consequently sentenced to shoot an apple from off the head of his own son. The apple was placed on the boy's head, the father bent his bow, and the arrow flew through the air and pierced the apple through and through. Gessler had seen that Tell before shooting had stuck another arrow in his belt, and now, after his successful shot, he asked him why he had done so. The reply is well known: "To shoot you, tyrant, had I slain my child."

Now the cross-bow which Tell is said to have used is shown at Zurich; but still the event never took place. One poor man was burnt alive for daring to question the truth of the story; but he was right. The tale is familiar to the mythologist. It is told not only in Iceland, Denmark, Norway, Finland, Russia, Persia, and perhaps India, but it is also common to the Turks and Mongolians, while a legend of the wild Samoyedes, who never heard of Tell, or saw a book in their lives, relates it chapter and verse of one of their marksmen. In its English form it occurs in the ballad of Cloudeslee. Even Sir Walter Scott, in the thirteenth chapter of his beautiful novel "Ivanhoe," seems to have had some such story in his head when describing the contest between Locksley and Hubert.

In point of fact, the story of William Tell is an old Aryan sun-myth, and Tell is the sun-god, whose rays of light, like arrows, never miss their mark, and likewise never fail to kill their foes.

If is wonderful how these and the like tales have held their own through

countless ages. Scientific education is daily becoming more appreciated, more honoured, more revered; and, as it speeds, truth will raise itself above superstition of all kinds. The doctrine of the correlation of force is one which has only recently developed itself. Motion, says Herbert Spencer, whenever we can trace its genesis, we find has pre-existed as some other mode of force. It has been established by scientists that all the various forces—light, heat, magnetism, electricity, sound—are all forms or modes of one unknown force that cannot be destroyed, are all capable of being produced by, or of producing one another. I rub a piece of sealing-wax, it becomes electrified, and will attract bodies possessing the opposite kind of electricity. The electricity was produced by my rubbing the sealing-wax, *i.e.*, by motion. Whence came that motion? From the contraction of the muscles of the arm and hand, and this power of contracting was gained by the decomposition and dissociation of the elements of which those muscles were composed—in other words, by chemical change. Every time we climb a mountain, or indulge in any kind of exercise, or active physical work, there is great waste of muscle tissue, and this waste is repaired by the blood, which at once carries fresh nutritive material to build up the wasted tissue, and brings away the products of the waste undergone by that tissue. The blood in its turn is obtained from the food we eat, and this depends upon the vital activities of other living creatures, animals or vegetables, while the vegetables, upon which all animal life depends, build up their tissues from the inorganic materials of the earth. This power they possess in virtue of the light and heat of the sun's rays, under the influence of which they are enabled to decompose the carbonic acid gas of the air. Thus, then, our power of doing work is traceable to the sun's energy.

Gentlemen, you have all heard of the Evolution Hypothesis—a theory which is now having such an important bearing upon medical science, rendering it more certain, less empirical, less vague, and far more valuable in its direct results. Of the many great and truly marvellous discoveries of modern science, none is so important as that which is called "The Germ Theory of Disease." It is indeed a subject of intense interest, and one regarding which people generally have not the clearest notions. You are aware that the poison or virus of the numerous fevers of men and animals multiplies in a marvellously rapid manner, and that they therefore spread quickly by contagion and infection. Even so long ago as at the time of the Great Plague of London, the belief was expressed that this pestilence was due to some living organism which entered the blood of man and multiplied there, and that this poison was capable of passing from him through the medium of the air, or, more certainly still, by actual contact, to others. Though, however, this shrewd inference from the facts of disease was drawn so long ago, it is only in comparatively recent times that by the aid of the microscope we have been enabled to detect the real nature of the virus of fevers and other maladies. In the case of very many disorders, both of men and of animals, it has been conclusively proved beyond all possibility of doubt that the virus consists of very minute vegetable germs which multiply in the body at an enormous rate, and by the great disturbance they set up, but too frequently bring on the death of the suffering patient. These germs are mostly Bacteria, Bacilli, and Micrococci, and they are of the very utmost importance, since they are the actual and direct causes of innumerable forms of disease. Scarlet Fever, Anthrax of man or malignant carbuncle, Cholera, Small-pox, Diphtheria, Leprosy, Consumption, or Tuberculosis, and many other infective disorders, have all been proved to depend on the presence of different kinds of vegetal germs in the blood and tissues. How clear it is that all the knowledge that can be gained about these vegetal organisms is of the most profound importance! Anthrax is a disease which attacks men and animals alike, and it is easily propagated.

In the human being it is known as woolsorters' disease, and as malignant carbuncle. It has been supposed to be identical with one of the plagues sent to punish Pharaoh and the Egyptians in the days of the captivity of Israel in Egypt. Now, the germ of this disease is called the Bacillus Anthracis, and numbers of these bacilli, which are little stiff rods, are contained in the blood. These rods multiply by division, and when they have free access to the air, bright oval spores make their appearance in them. They are best seen in a drop of blood magnified, so as to appear seven hundred times as large as they really are.

Turning to the disease called Consumption or Tuberculosis, the wildest notions as to its origin and causation are extant; but this is not to be wondered at, seeeing that it is only a few years ago, viz., 1882, that the bacillus which causes this dread malady has been discovered by a physician of Berlin called Koch. In all cases of Tuberculosis in man, cattle, and monkeys, this talented observer found peculiar fine bacilli, some with bright oval spores, some without, some smooth and homogeneous-looking, others more of a beaded appearance. These bacilli can be seen by the physician even at an early stage of the disease by means of the highest powers of the microscope in the matter coughed up by a consumptive person, and if he sees these bacilli, he knows for an absolute certainty that his patient is suffering from this horrible malady.

There is another fact of great importance regarding this disease, and it is that it is very commonly brought about by damp, damp houses, damp countries, damp clothing. It is not improbable, though it has not been actually proved, that the malady is communicated to human beings from cows through the medium of milk. Indeed, the whole question of the transmissibility of diseases from animals to man is one of profound significance, and one of which all scientific medical men must have some knowledge. Scientists are on the verge of great discoveries. Within the past ten years facts of immense moment have been discovered, and daily we are learning fresh sets of facts, which alter many old notions as to the treatment and management of disease.

You are aware, gentlemen, that the gas called oxygen is the most important element contained in the air. On its presence, animal life at least, and perhaps vegetable life also, depends, and the purpose of breathing is, on the one hand the inhaling of this gas oxygen, whereby the various parts of the body are oxygenated and kept active, and on the other the expulsion of carbonic acid gas, which is poisonous to animal life, though a source of nutriment to the vegetable creation. Now oxygen seems to be favourable to the growth and activity of bacilli, while its more active allotropic modification called ozone, seems to have a marked retarding effect upon them. This latter agent, ozone, is therefore of great value in combating certain germ diseases. Ozone is more active than oxygen, and possesses greater oxidising powers. It exists especially in sea-air, and hence the great utility of a seaside residence at a place such as Marblethorpe or Sutton on our coast, and of sea-voyages.

You are perhaps aware that Tubercle, Rheumatism, and Cancer are comparatively common in our country; Rheumatism, indeed, is very often met with. I think that notable spa at Woodhall is not sufficiently valued by us for its remarkable curative properties in cases of old-standing Rheumatism. I may tell you, gentlemen, that for old rheumatic diseases, I regard it as the most important in the world. I have personally visited a great number of the Continental spas, with the view of becoming intimately associated with their special characteristics, but for the treatment of Rheumatism I have met with none so valuable anywhere as the mineral waters of Woodhall.

I have not time, gentlemen, to speak in full of the maintenance of health,

but I may mention some points of importance. It is not generally known how detrimental to health is passion, and how injurious to a proper performance of life's processes is undue trouble or anxiety. Plenty of exercise in the open air is essential to good health, and a calm equable temperament a disposition to be sought after and desired.

FIRST REPORT OF THE PATHO-BACTERIOLOGICAL EXPERIMENT-STATION FOR CONTAGIO-INFECTIOUS ANIMAL DISEASES OF THE STATE UNIVERSITY OF NEBRASKA, U.S.A. (FRANK S. BILLINGS, D.V.M., DIRECTOR.)

BY THOMAS BOWILL, M.R.C.V.S., ASSISTANT.

(*Continued from p.* 112, *vol.* xxiv.)

I think it well to mention that the colouring power of the solutions is much increased by adding the necessary quantity of a saturated alcoholic solution of the colouring fluid to a little more than equal part of a solution of caustic potash, one to ten thousand of water. This organism offers some very puzzling biological conditions to the eye of the observer; for, in studying its development with coloured preparations from cultures under the microscope, the observer will often see objects strongly resembling micrococci in appearance; more careful observations, however, will show that this is simply a stage in the development of this organism, and very careful observation will show that the cocci appearing objects invariably have an ovoid form, though not so well marked as in mature bacteria. They proliferate with great rapidity. The first phenomena seen is that the object increases in length and somewhat in breadth, the uncoloured substance, which appears to be a secretion of the poles, although the contrary may be the case, becoming more plentiful, when first one and then the other pole-end, or coloured substance, is separated, leaving two of the cocci-like objects as fine bodies in the culture. These are at first small, but rapidly increase in size, so that in the same field one has an appearance, which would lead him to think, in coloured specimens, that the culture had become polluted, unless he had seen the organism develop under the microscope in what is known as a "hanging drop," which is prepared as follows: Take an object glass that has a hollow chamber ground out it in; surround this chamber with a thin layer of vaseline; then take a clean sterilized covering glass and place in the middle of it a drop of sterilized beef infusion or bouillon, which is inoculated from any culture; the covering-glass is now to be carefully turned over and placed upon the object-glass so that the drop is in the middle of the excavation; it is then to be pressed down upon the covering glass, the vaseline making an impervious cavity, so that germs from the air cannot get in and evaporation does not take place.

Beef infusion gelatine is prepared as follows: Fresh lean beef 250 grammes; to this add 500 grammes of distilled water; place in a cold place for twenty-four hours, then strain off until you get 400 grammes of fluid, to which add ten per cent. of gelatine of the best quality, one per cent. peptone, one-half per cent. cooking salt, cook until the albumen is entirely precipitated, then neutralize to a slightly alkaline reaction, then strain off into sterilized test tubes plugged with sterilized cotton—fill tubes about one third—sterilize this mass once more by heat, using care, or the stiffening power of the gelatine will be destroyed. Agar. agar. is prepared in

a similar manner, one and not over two per cent. being substituted for the gelatine. Agar. agar. makes a gelatine that can be used at any ordinary heat of summer without becoming fluid, whilst gelatine melts between twenty-five and thirty degrees per cent.; it is also of no use to increase the quantity of gelatine, as by doing so you do not get a proper development of the bacteria. Inoculation of these bacteria in gelatine gave peculiar colony-like developments somewhat resembling knots on a fine piece of thread, and not causing fluidity.

Since 1878 an almost continued series of investigations into the cause and nature of Hog-cholera have been made under the auspices of the Agricultural Department of the United States, which are to be found in its reports. The first of these were made by Messrs. Law and Detmers. Law seemed to have considered the disease to be due to a micrococcus, quoting Klein in the following language in the report of 1878:—"Klein, who, in 1877, cultivated a micrococcus for seven successive generations, and finally inoculated the fifth and seventh generations successfully on two pigs, seems to have established that these microphytes are the ultimate cause of the disease." Detmers, in the same report, seems to have thought that a bacillus was the cause of American Swine-plague, to which he gave the name of "bacillus suis," which, he says, "are found invariably either in one form or another in all fluids, in morbidly affected tissues, and in the excrements (?) and constitute beyond doubt the infectious principle or produce the morbid processes, if transmitted directly or indirectly from a diseased animal to a healthy one!" It is singular that both of these authorities should have received what appeared to be equally positive and confirmatory results from two such entirely different organisms. The work of these two men is, however, entirely eclipsed, at least in volume, by that of Dr. Salmon, who also made his first report to the Commissioners of Agriculture at the same time (1878), and who has been engaged upon a more or less continued series of investigations for the Agricultural Department, upon this disease which have been published in its annual reports ever since.

With Law, Salmon seems to have looked upon a micrococcus as the cause of this disease up to the year 1885, and to have received experimental testimony, which justified him in saying:—"*Surely we have here sufficient evidence that a reliable vaccine might easily be prepared, if we carry our investigations a little way further.* (Page 57, report of 1883.) In another place the same authority says of this micrococcus "*that these experiments were made and accounts of them published in advance of those of M. Pasteur, and the evidence furnished was all that could reasonably be required to decide a scientific question of this kind.*" In the report of 1884, page 229, he (Dr. Salmon) enters into a polemic against Dr. Klein of England, who had discarded his micrococcus in favour of a bacillus, and then says:—"*A large number of observations, similar to the above, have been made, and in all cases, where a pure cultivation has been obtained, the organism which multiplied was a micrococcus, and when the virulence of such cultivated micrococci has been tested by inoculation experiments, typical cases of Swine-plague have resulted.*" Any one who carefully reads these reports, which Dr. Salmon has made, in regard to his experiments with this micrococcus, would certainly be led to the conclusion that "*the evidence furnished was all that reasonably could be required to decide a scientific question of this kind,*" but alas! it does not seem to have brought Dr. Salmon even to any decisive conclusion, for in his report of 1885, page 785, he seems to have had some doubt about the correctness of this testimony, and that the scientific question had not yet been decided by him. Here he tells us that he was "*perplexed by contradictory results, and failing to obtain any pathogenic germ by isolating the different forms found in peritoneal effusions. The discovery of a fine bacillus in Germany causing a disease in*

swine, which was regarded as identical with Swine-plague in England and the United States, attracted our attention." It is difficult to see why Dr. Salmon should have become so suddenly "perplexed" in the face of the "evidence furnished by him which was all that could reasonably be required to decide a scientific question of this kind;" and which was apparently backed up by the most positive inoculation experiments.

But, alas, for mortal frailty! in the report of 1885 we are surprised at finding that Dr. Salmon no longer considers his micrococcus to have any important etiological connection with Swine-plague. He says, on page 212, report of 1885, "*that in at least twenty-five cases of undoubted Swine-plague, pieces of splenic tissue, when spread out in a thin layer on a cover glass, dried and stained, in some analine colour, were found to contain the same microbe in greater or less abundance,*" and calls attention to an illustration which he has marked plate III. figure I.—"*When strained for one or two minutes in an aqueous solution of methyl violet, and examined with a Zeiss one-eighteenth homogenous lens, they appear as elongated ovals, chiefly in pairs; the greater number present a centre paler than the periphery. This may be due to a greater density or staining capacity of the peripheral portion. The darker portion is not localised at the two extremities, as in the bacteria of septicemia of rabbits, but is of uniform width round the entire circumference of the oval.*" Dr. Salmon gives exactly the same kind of experimental evidence which he furnished in previous years for the etiological connection of his micrococcus of these years with Swine-plague.

It may also be assumed that he has this time "*furnished evidence which is all that could be reasonably required to decide a scientific question of this kind.*" It is also surprising that Dr. Salmon's description of the manner by which this microbe of his developes in gelatine and on potatoes exactly corresponds to the above of Dr. Billings. On page 215, report of 1885, Dr. Salmon says:—"The bacteria manifests growth (on potatoes) by first staining the cut surface of the potato at the place of inoculation with a chocolate colour," which Dr. Billings thinks corresponds near enough to our coffee colour. He also gives a description of its growth in gelatine on page 214, report of 1885, which exactly corresponds to that I have given above for Dr. Billings, and which Professor Schütz gives for that found in Germany, and illustrates it with plates, which show a very marked resemblance to those of the cultures of Dr. Billings.

The description which Dr. Salmon gives of the manner in which his new microbe reacts against colouring matter, does not correspond to any known variety of bacteria or cocci, but to spores, and I must therefore conclude that he has not yet given satisfactory evidence as to its etiological connection with American Swine-plague, for the bacteria which I have myself coloured in the effusions, blood, and tissues of undoubted cases of Swine-plague, under Dr, Billings' directions—(some specimens of which I have the pleasure of laying before you, and which will undoubtedly convince you of their nature) *are invariably coloured at both poles, with a clear centre, in the body of the bacteria, and a blue line of connection along the periphery.* As I have previously said, I have never failed to find this bacteria in every case. As we nearly always killed the animals, I found them in the spleen, kidneys, and lymphatic glands in an absolutely pure condition. In some few cases where the animals had been dead some few hours, but where the autopsies were made early in the morning, before heat had time to set up decomposition of the carcases, and the animals had died during the night, I found a few cocci and bacteria of putrefaction also present, but the genuine bacteria always predominated.

In England, Professor Walley recently read a paper on Swine-plague before the third annual meeting of the National Veterinary Association of England. I agree with him as to the term "Swine-plague" being the most descrip-

tive and technical designation for the disease. On the other hand, I must object to his definition, by which he describes the disease as a "*specific eruptive fever, peculiar to the pig*," because there is no such thing as a specific fever that has lesions, only produced by the rise of temperature, fever being but a symptom, which accompanies to a more or less degree nearly all irritative disturbances in the animal organism. This practice, not only in veterinary, but human medicine, of describing diseases as fevers, simply because they are accompanied by a rise in temperature, is and has been a great injury to students, tending to mislead them from a true conception of the pathological essentials in disease. The disease which comes nearest to being an exception to the above is Febris intermittens, commonly known as fever and ague; but it has its specific symptoms, which, while accompanied by fever, have nothing to do with it, but are dependent upon the presence and action of a known germ (the Spirocheton Obermeiri) in the organism. Tetanus is another disease that is accompanied by fever, but has its specific phenomena by which we know it. Swine-plague proper, as I have seen it in America, is by no means an "eruptive" disease, if by "eruptive" Professor Walley means skin-complications. The peculiar discoloration of the skin is due more to disturbances of the circulation and stasis than anything else, though it may be that embolism, due to the micro-organism, plays some part in it; especially as the phenomena seen would seem to indicate that these discolorations are either due to the interference of the circulation in the arterioles or a venous reflux. The vis a fronti being interfered with, especially as I find the myocardium in all cases in a condition of degeneratio adepoisa (myo-malacia). It seems somewhat singular that when such eminent authorities in England as Klein, Axe, and others have been working for so many years (since 1876) on Swine-plague, they should not have been able to discover the true micro-organism. It is also singular that Professor Walley should have made no mention of any other work done in America than that of Professor Law, and have neglected to mention that of Detmers and Salmon, especially that of Detmers, for, pathologically considered, it gives the best descriptions of lesions of Swine-plague and its clinical variations that have yet appeared. Dr. Billings' experiments go to prove the correctness of Walley's conclusions in regard to abortion, *as the micro-organism has been found in both the amniotic fluid and spleen of fœti where the mother has recently died, and the young were dead.*

Professor Walley's description of the lesions in the kidneys is very meagre, as shown in the autopsy quoted, as in every case which we have seen the disease is characterised by swollen kidneys and an excessive degree of parenchymatous inflammation. But his description of the hemorrhage into Bowman's capsule, or excessive congestion of the malpighian tufts, is quite accurate, as it has been frequently seen here. His remark, that pulmonary lesions are not very constant or necessary, does not correspond to the experience of Detmers or Billings in America.

In an outbreak among seventy-five hogs, which have been placed at the disposal of Dr. Billings, the pulmonary lesions have far exceeded in intensity those of the intestines; the latter, with the exception of capillary congestion and swelling of the mucosa, with more or less intestinal catarrh, which in some cases was entirely missed in the large intestines, having been entirely wanting in ten autopsies thus far made, the animals having died of Œdema pulmonum. The pneumonia in hogs, so far as we have seen here, has been of a bronchial character, leading to caseation, and in some instances to necrosis, hemorrhagic infarctions being frequent. It seldom happens that the intestinal tissue becomes complicated by indurated process, unless it be in very chronic cases; in general those tissues are œdematous and swollen.

Our microscopical observations in the above outbreak do not go to confirm

Walley's assertion that, "as a rule, the fæces are either semi-solid, or of a liquid consistency;" as constipation has not only been remarked in this outbreak throughout, but in many others. When the intestinal lesions predominate, diarrhœa is undoubtedly present. His description of the mottled appearance of the lymphatic glands, which he compares "to the appearance of a 'queen's strawberry,'" has also been met with by us in all severe cases.

Mr. Archibald Robinson's remarks in the discussion of Professor Walley's paper, "that in the district of Baden, Germany, inoculation has been successfully carried out," show that he does not know what disease the Baden investigations had to do with, or else he has a very poor knowledge of German. The Baden investigations were made by Drs. Lydtin and Schotellius in regard to the protective powers of M. Pasteur's "Vaccine contre rouget," which is the same disease as the German "Rothlauf," or erysipelas of swine, a disease which has no pathological or etiological connection with Swine-plague in Germany, England, or America; the micro-organism of this disease being a bacillus or rod bacteria, while that of Swine-plague in both Germany and America is an oval body.

I have already alluded to the mild course the disease has taken in Nebraska, which will account for the number of pigs inoculated by Dr. Billings, which did not necessarily die. Up to the present time the whole number inoculated has been twenty; number of deaths, eight; and of three rabbits, all died within four days; also inoculated three dogs without any effect, except the formation of an abscess at the locus of inoculations.

On account of Prof. Schutz having described the German disease as an "Infectious pneumonia," and having found a bacteria so nearly corresponding to ours, Dr. Billings decided to introduce the artificial virus directly into the large intestine, thereby lessening the chances of the bacteria being conveyed at once to the lungs, either by the lymphatics or blood-vessels, to the least degree possible. But with all these precautions he had more or less lung-complications in every case, though the intestines also contained lesions. It might be interesting to you for me to report an autopsy on an animal which was subjected to one of those experimental inoculations. The subject, a hog four months old, absolutely healthy and in fine condition, was inoculated with material which Dr. Billings obtained from some sick hogs at Rising, Neb., September 20th, 1886, and which had been carried rapidly through three culture-generations—the bacteria being present and in an absolutely pure condition. This hog was inoculated on September 28th. The following changes took place: October 1st, off its feed, and continued to be more so until it was killed, October 7th, temperature for several days about 104° Fahr.; October 3rd, it began to emaciate and had a distressing cough, with yellowish discharges from the nostrils and a pultaceous discharge from the rectum. Being very sick on the 7th of October, and liable to die before next morning, it was considered best to kill the animal, which was done. No staining of the skin was observed (it was a very black pig). The animal was inoculated as described above, but in some few cases, where we have resorted to subcutaneous inoculations, we have had excessive tumefaction and heat, with discoloration of the skin. On cutting through the skin of this animal, the blood which flowed from the cut vessels was of a dark blue red colour, and soon coagulated and became red on contact with air. The large intestine was agglutinated and covered with a thick, floculent lymph. The superficial inguinal and mesenteric lymphatic glands were swollen and reddened, and the mesenteric veins injected; bladder full. The small intestines presented a diffused red colour; on opening, the mucosa was found swollen with diffuse capillary redness; Peyer's patches swollen, with an occasional dark red spot in their midst; contents of intestines were fluid. The mucosa of the large intestine was red and swollen; also with dark red spots of various sizes

dispersed through it; ileo-cæcal (or valve of Bauhini) intensely swollen. Throughout the large intestines were numerous ulcerations from the size of a pea to a ten-cent piece, covered with a yellow, caseous mass; spleen enlarged, but not disintegrated; liver enlarged, edges rounded; the acini distended and of a yellowish-red colour (degeneratio adiposa). The interstitial tissue was swollen, and the bile-ducts somewhat distended with bile; kidneys, cortical substance, anæmic, and of a yellowish-grey red colour; medullary substance, red, and the vasa recti injected; slight effusion into the pleural cavity, but the pluræ non-adherent. The pericardium contained about two tablespoonfuls of a straw-coloured fluid; the myocardium was of a yellowish-grey red colour, anæmic, and a few petechiæ on the endocardium. In the lungs were small centres of lobular hepatization. The bronchial tubes and trachea contained a purulent, viscid effusion, the mucosa being swollen and injected; bronchial lymphatic glands enlarged and œdematous; stomach had its mucosa swollen, ulcerated, and covered with a viscid mass, and near the pyloris stained with bile. Microscopic examination of the spleen and blood revealed the presence of the characteristic bacteria.

(*To be continued.*)

Proceedings of Veterinary Medical Societies, &c.

ROYAL COLLEGE OF VETERINARY SURGEONS.

SPECIAL MEETING OF COUNCIL, HELD AUGUST 10TH, 1887.

SIR HENRY SIMPSON, President, in the chair.

Present:—Professors W. Duguid, W. Pritchard, W. Robertson; General Sir Frederick Fitzwygram; Dr. Fleming; Messrs. J. Roalfe Cox, Thomas Greaves, Mulvey, James F. Simpson, James Storrar, William Woods, and the Secretary.

The SECRETARY read the notice convening the meeting.

The SECRETARY read the minutes of the previous meeting, which were confirmed.

The SECRETARY read the minutes of the previous Special Meeting, which were confirmed.

Professor PRITCHARD said he noticed that the copies of the Revised Bye-laws, which had been circulated, were printed by Oxley and Son, in Windsor; he should like to know whether the printing had been removed from their ordinary printer.

The PRESIDENT said there was nothing to prevent the President having the printing done where he chose. In the present case, however, the Revised Bye-laws had been printed in Windsor to save time and himself coming to London to revise the printer's proof. He had devoted many hours to the revision, and had caused a printed a copy to be sent to every member of Council some days ago. The Charter only allowed seven days within which to hold a meeting to confirm the Bye-laws as revised at a previous meeting. Only fifty copies had been printed.

The SECRETARY read the following letter from Mr. George Thatcher, the solicitor:—"I enclose proof of Revised Bye-laws which have been sent me; I have compared them with the Act and Charter, and they appear to be in accordance therewith. I assume that all formalities have been complied with as required by the Charter."

The PRESIDENT stated that all the requirements had been complied with. The meeting had been held within fourteen days from the last meeting, and all the notices had been given.

Dr. FLEMING said that the circular he had received urgently requested him to attend the present meeting, and he had therefore done so; but he must

confess that he was disappointed that the meeting should have been held on the day of the National Association Meeting at Peterborough.

The PRESIDENT said that four clear days' notice must be given, not including the day on which the meeting would be held, and the day on which the notices were issued. The onus of compiling and setting fair the work of the Bye-laws Committee had been absolutely placed upon himself, and he had done his best to make a good business of the matter. That day was really the only possible day on which the meeting could be held, and he must say he had not expected any severe criticism in the matter, especially as the Bye-laws had been standing over for several years.

Dr. FLEMING said he did not convey the slightest censure or disapprobation of the course pursued; he had only remarked that it was an unfortunate coincidence that this meeting should be held on the same day as the meeting of the National Association. He thought that the bye-laws said, "Any time within fourteen days."

Mr. J. F. SIMPSON remarked that the Charter said "Not less than seven, and not more than fourteen." That only gave the President a few days to arrange the matter.

The SECRETARY read the following letter from Professor Walley, addressed to the President:—

"As you are well aware, the Principals of the Scotch Colleges are desirous of doing away with the Summer Session, and in order to enable us to do so we have agreed to open on the 2nd or 3rd of October, and to teach, without intermission (except a short interval at Christmas) until the first or second week in May, so that we may get in the three specified terms of two eleven weeks and one of eight; and we further propose that there shall be only two examinations in the year, namely, at Christmas and early in May, thus reducing expenses, etc. Will you take the sense of the members present at the meeting on Wednesday, if it is held, on these suggestions, so that we may make our arrangements and get out our prospectuses? We think the doing away with the interval in April between winter and summer sessions will be beneficial, by keeping the students to their work—both studying and teaching are very difficult during hot weather, and dissecting cannot usually be carried on after April. Moreover, by the arrangement proposed, the students will not be wasting their time and means by travelling backwards and forwards home in April, and they will get from four to five months' continuous practice in the summer instead of a few weeks, and none at all, as per present arrangement. Please drop me a line to Edinburgh as early as possible as to how these proposals are received by members of Council present at the meeting."

The PRESIDENT moved that Professor Walley's letter be referred to the Examination Committee.

Mr. WOODS seconded the motion.

Dr. FLEMING moved that the letter be read at the next meeting of the Council. It was an important change that was being asked for, and he thought the whole Council should hear the letter before it was referred to the Examination Committee.

Mr. JAS. F. SIMPSON said it was the same thing, because the whole Council constituted the Examination Committee.

Professor PRITCHARD supported Dr. Fleming's proposal.

Professor ROBERTSON said he would second the amendment proposed by Dr. Fleming. The present meeting was a special one, and members of Council were not aware that the matter was to be brought forward. Undoubtedly, in his opinion, the letter should be read to a full Council meeting first, although he was afraid that the next meeting might not be the whole Council but a sub-committee of the Council.

The PRESIDENT said there was this unfortunate objection to the amend-

ments, that before the next meeting of the Council, at which the letter could be discussed (the October meeting), the whole of the examination business would have been threshed out. Under those circumstances he hoped the meeting would allow the matter to be referred to the Examination Committee. With regard to referring the matter to a sub-committee, he would remind the Council that the sub-committee was only granted to tabulate and revise, and thus make more easy the work of the Council, which would meet from time to time as the Examination Committee.

Professor ROBERTSON said that under those circumstances he had no objection in withdrawing his proposal.

The PRESIDENT said that it was quite in order to have the letter read. If it were referred to the Examination Committee they would be gainers by it in the end. He thought it was the unanimous wish to thoroughly thresh out between now and October the whole subject of examinations. He hoped, therefore, that Dr. Fleming would see his way to withdraw his amendment.

Dr. FLEMING said that this was a special meeting of the Council called for the specific purpose of passing certain bye-laws, and was not a full meeting. He thought the proper and formal course would be to have the letter read at the next meeting, and then refer it to the Examination Committee.

The PRESIDENT said he must differ with Dr. Fleming upon that point. His own experience of public business led him to say that they were perfectly in order in having the letter read and then referring it to a committee.

Dr. FLEMING thought that no time would be lost if his proposal were adopted.

Professor PRITCHARD agreed with Dr. Fleming, and said he did not think the matter should be sprung upon the present Council meeting.

Professor ROBERTSON said the letter referred to educational regulations which would be required to be carried out, and it might be referred to the Committee with perfect propriety. But looking at it in true formal light, it really ought first to be brought before the Council. If, however, it was to facilitate matters, he had not the slightest objection to the matter going at once to the Committee, which was the whole Council.

The amendment was then put to the meeting and carried.

General Sir FREDERICK FITZWYGRAM asked whether the Scotch schools could not act in the matter without the consent of the Council. He thought it would be within their legal limits to divide the terms into two, provided they complied with the necessary number of weeks. There would, therefore, be no hurry in sending an answer to Professor Walley.

Professor ROBERTSON said he had discussed the subject in consultation with the teachers of the schools in the North, and he was perfectly certain that, provided they complied with the required number of weeks, they had power to act without asking the Council.

The PRESIDENT asked if any gentleman would be kind enough to move that the bye-laws as amended be confirmed.

Dr. FLEMING moved that the bye-laws be confirmed.

Mr. WOODS seconded the motion, which was carried unanimously.

The PRESIDENT said that the bye-laws would not be seen by the bulk of the profession until next February or March in the new register. It was a question, therefore, whether it would not be desirable to make the profession generally acquainted with the bye-laws, and if so, whether the Committee would have a certain number printed and circulated.

Professor ROBERTSON said he did not think that such a course was needful. When the regulations with regard to the examination of students were settled, they would be incorporated with the bye-laws.

The PRESIDENT thought there would be no harm in letting the matter stand over until October for that purpose. He had had fifty copies of the

bye-laws printed, and that would be sufficient for the members of the Council.

Professor ROBERTSON proposed a vote of thanks to the Chairman, which was agreed to.

BORDER COUNTIES VETERINARY MEDICAL SOCIETY.

(*Continued from page* 220.)

When this occurs, ten to one the bull has done some damage in the urino-genital passage, and made any operation to relieve the animal of a more hazardous character. As an aid to diagnosis, and to satisfy myself that I have got a case of *impervious vagina* to deal with, I make an examination per rectum, when I find the uterus very much enlarged, and seemingly holding a large quantity of accumulated debris. The character of the complaint is at once settled, and the sooner she is operated upon the better. Now as to the mode of operation to relieve this abnormality, I expect to find myself at variance with some members of the veterinary profession. Some adopt an instrumental procedure, even at the risk of serious and irreparable damage to the uterine appendages of the animal, forcing an opening through the os with some tubal instrument, such as Reid's probang, or trocar and cannula, or some other instrument. So far as my experience goes, I have never found it possible to obtain a passage with an instrument without great risk, and I prefer the more cautious if slower process of manual operation. With a small hand an operator can manage to worm a passage through the vaginal canal with his thumb and two fingers, and he knows what he is doing, whereas with an instrument, he does not. Once a passage is obtained, and the contents of the uterus evacuated, the insertion of an instrument daily to assist in the subsequent discharge is easily performed. So far as after treatment is concerned, I have employed antiseptic injections, and one combining both anodyne and antiseptic is much to be preferred. I hardly need tell the members of this Association that the best end for animals of this description is to have them fattened for the butcher as soon as possible.

Now, gentlemen, connected with the subject of bovine unfruitfulness is bovine abortion, which ever and anon crops up as a topic to either advance an opinion or form discussion. Both Professor Lewis and our Secretary have had the subject recently before the profession and the public, and it is with great diffidence I to-day make any attempt to reopen the subject before the members of this Association. However, it being a subject which is of the utmost importance to agriculturists, from the nuisance, not to say loss, which in inflicts upon farmers, and if any good at all can be done, it must be through the agency of our profession to provide the remedy, either as a cure or a preventive. With this view constantly before us, I think, with the constantly increasing aids which pathological science reveals, we should not rest till the mysteries connected with this complaint are revealed. On the various causes of bovine abortion resulting from accidents, ill-usage, over-driving, etc., I do not propose to dwell, as these are so very obvious, and out of our control, that it is needless to discuss them in a paper of this description. It is to a class of cases which approaches the endemic or contagious character, which I wish to say a few words upon, and in approaching the subject, it may be as well to confine the discussion to causes which favour this view, therefore I say it is to those cases which follow each other, where a stock of cows or heifers part with their embryos at from six to nine weeks to four to six months after taking the bull. One of the most prominent and favoured views which not only practical agriculturists but veterinary surgeons adopt is, that it is to a kind of sympathy arising from the smell of the effluvia discharging from the

generative organs of an aborting cow which keeps up the habit. But seeing that cows in general are very fond of smelling at discharges from cows after a natural and healthy parturition, and this habit does not produce abortion, in some measure does away with the sympathetic theory. Another cause which scientists have often dwelt on is, that ergotised grasses have a baneful effect on the fœtal membranes and uterus, but seeing that experiments have proved that ergot, instead of producing a contracting effect upon that organ, has the very opposite action of retracting, therefore I think both these favourite theories may be abandoned.

I think the experiments of M. Nocard, as set forth in an editorial article in the VETERINARY JOURNAL of January last, not only important but deserve serious consideration by agriculturists. M. Nocard has, to my mind, proved by experiments, that abortion in cows has all the characteristics of a contagious disease. He says that the yellow pus-like matter which drains from the vulva after abortion abounds with micro-organisms of the bacilli and micrococci type, and that these microbes are capable of cultivation in fowl or veal "bouillon" or broth. He also finds that the liquid obtained by scraping the mucous membrane of the uterus of aborting cows is not only acid, but swarming with microbes, especially between the mucous membrane and the fœtal envelopes, and after the expulsion of the fœtus these micro-organisms exist without impairing the health of the animal, but are ever ready to react upon a new fœtus or its envelope, and this, according to M. Nocard, is the cause of repeated abortion in the same animals. He also explains executive sterility to be due to the acid reaction of the uterine fluid, which he says favours the perpetuation of those kinds of microbes, and at the same time destroys the vitality of the spermatozoa. Whether this condition exists in those animals I have previously alluded to as being conditionally unfruitful, but will not conceive, I have no data to form an opinion on. On the other hand, he finds that cows that carry their calves to the full term are entirely free from these microbes, and also that the secretion, or natural discharge, is *neutral*. Calves born alive, that have been prematurely expelled from similar causes, are found to abound with these microbes along the digestive canal, and this explains the continuous bellowing, and the numerous deaths from diarrhœa in young animals. Now, gentlemen, if those ideas of M. Nocard, which seem to have been established on reliable data, are admitted by you, the question of prevention, and also that of medical treatment is much simplified. As to prevention, I think I shall be borne out when I state that the first introduction of this malady on a farmstead is by the purchase of a cow, which has either aborted or come from an infected farmstead, and which in all likelihood brings the contagion with her. What is more frequently seen in fairs or auction marts than cows and heifers which have aborted, the owners of which know how easily non-professional eyes are deceived, and if she can only, by overstocking or other means, be got to show a decent udder, she has only to be represented as a newly-calved cow to pass muster on the face of any rules which an auction company may hold up. The consequence is the incalculable loss inflicted on the purchaser for years by the loss of his calves, and also the profits which accrue from a well-selected stock of dairy cows. *Anthrax* is a disease which the Lords of the Privy Council have recently decided to place under the restrictions of the Contagious Diseases (Animals) Act, but the loss incurred by Anthrax, I venture to think, is but a flea-bite to that inflicted by contagious bovine abortion, and if such associations as this coincide in similar views, and make representations to headquarters, I think the day will not be far distant when this malady will receive similar treatment to Anthrax by being brought under the Act, and thus stop the sale of cows till all unhealthy discharge ceases, and the animal is pronounced safe. As to medical treatment, I think if what I advance turns out

in future times to be orthodox, the treatment resolves itself to giving medicines, combining an alkaline with an antiseptic as a basis, and carminatives as adjuvants. Some good, I think, may be done by the injection of an alkaline antiseptic lotion into the uterus, previous to allowing service with a bull, but of the latter procedure as a remedy for abortion I have as yet had no experience.

Another, and not unfrequent accident or morbid condition attached to the period of gestation, and one which a country practitioner is not unfrequently called to operate on, is complete closure of the Os uteri. A cow is said to have completed her full term of pregnancy; she has suddenly become uneasy, shifts from one side of the stall to the other, and strains at times very considerably. The owner, or perhaps the nearest cow-leach, has been exploring the uterine tract with the view of removing the calf, but the want of a passage into the "calf-bed," and the inability to make one, are serious impediments in the way of unprofessional or unskilled men, hence the necessity to call in the veterinary surgeon to cut a passage. Generally in these cases, on examination we find that no special preparations have been made for parturition. It is on record that professional men have set to work at once, and divided the Os uteri its whole length, and abstracted the fœtus, and the cow has done well. I must confess my doubts as to practice of this kind, and though having repeatedly been asked to operate in this way, I have, up to this time, steadily refused, and with the best results where my advice was taken, and with fatal results when my advice was disregarded. I submit for your consideration the best plan for us to adopt in all or most of those cases is to stop the straining by some anodyne, as Tr. opii, or chloral hydrate, followed up by a dose of laxative or purgative medicine, according to the circumstances indicated by semiology, and leave nature to make her own preparations for expulsion of the fœtus. Generally we find in from four to seven days the cow begins to show symptoms of the natural opening of the uterus by a slimy discharge and more pronounced labour pains, and if the presentation is a natural one, she calves herself without assistance. Therefore, I submit it is the best policy to let such cases alone, notwithstanding any erroneous views our clients may have; at any rate, if they are determined to have the animal operated on in the way I have indicated, let them fall back on their "first love," the cow-leech, and let him destroy her, which, I venture to think, eight times out of ten will be the result.

Gentlemen, having now briefly sketched some morbid conditions attached to the uterus of the cow prior to parturition, if your patience is not quite exhausted, I will introduce for your consideration one or two which occur subsequently, and which, from their urgency, are of rather serious import, not only to ourselves, but to our clients. The first condition of this kind I shall mention is hæmorrhage from the uterus after parturition. This accident or condition is for the most part due to mechanical injury inflicted in the act of abstracting the fœtus by unskilful hands. As you are aware, the internal surface of the uterus presents a number of cotyledons, fitting into similar cotyledons on the placenta. By these highly vascular objects, blood is conveyed from the mother to the fœtus. In removing the placenta from these uterine cotyledons, no blood-vessels are torn across; but by rough handling very often the mouths of innumerable small blood-vessels are torn across, causing extensive hæmorrhage. I need not enumerate the symptoms, the blood being ejected from the vulva, about a quart at a time, mixed with clots. This going on for four or five hours, reduces the animal to a helpless state of emaciation, indicated by hard blowing and debility, the constant and concomitant symptom of loss of the vital fluid. Another cause of hæmorrhage is rupture of the Os uteri, in extracting an extra large or swollen calf. The calf may be presented naturally, and with the usual farmhouse force;

the extraction seems to be going on all right, till the calf gets to about the midribs, when the vulva gives way. To proceed after this happens is very risky, as by the time you have obtained the calf you may find the rupture has extended all along the vagina to the Os uteri, rupturing the vaginal artery, or some of its branches, and the speed at which the blood escapes does not give one much time to either think or study the case. The question is to decide the best means of checking hæmorrhage from the uterus. It must be borne in mind that the uterus of a cow during the parturient stage does not, owing to the non-continuity of the blood-vessels between the uterus and the fœtal membranes, contract so readily as in some mammalia, and this defect is an obstacle in the way of administering astringents, either by the mouth or by injection. In the case of ruptured cotyledons, cold water is injected into the uterus by some practitioners, and also applied freely to the loins. For myself, I do not like injections of any applications to the inside of the uterus in these cases, as the force employed sets up an amount of straining which provokes rather than retards the bleeding. I prefer any application to be administered in this direction to be accomplished by gravitation. In the case of ruptured os, the torn vulva, etc., facilitates matters very much by giving room to seize the artery at once, and pull it outside, where it may be ligatured, and this is, in my opinion, all that is required to stop the hæmorrhage. Stimulants should be given freely, and the wound treated as any ordinary wound.

I now come to discuss not only Milk Fever proper, but also other complaints following parturition. *Milk Fever* proper, "*Parturient Apoplexy*," is a derangement seizing cows having a highly developed lacteal apparatus, from three or four days to a week after calving. The udder is often hard, hot, and tender, which has often a tendency to produce a good deal of feverishness. This has the effect of not only interfering with the lactiferous secretion, but also the functions of the stomach and bowels, and from reflex action, the nervous system becomes affected, the gait becoming unsteady, and, finally, locomotion is lost and the animal drops. The appetite is seldom altogether lost and she chews her cud at times. The function of the udder is suspended, and from the milk being thrown back on the system, a good deal of hard breathing is set up, but the pulse remains regular though quickened. The complaint is very seldom fatal, and I submit for your consideration a powerful dose of purgative, diaphoretic, and diuretic medicines combined.

The following suggests itself: Magnes. Sulph. Hi, Potass. Nit. ʒii to ʒiii, Sulph. Sub. ʒiii, with some carminative. Ol. Junip. or Bacc. Junip. may be substituted for the Potash. This, followed up by warm clothing, fomentations to the udder, with frequent drawing, will very often put your patient on her legs in less than twenty-four hours and you get credit for being very clever. If the young practitioner can only get three or four such cases hard running and succeeds, his reputation is almost established and his elder brethren made to look very small. Passing on to another ailment connected with the parturient stage is one which sails under the common flag of Milk Fever, but which in reality approaches more the Parturient Fever of the human female. Its first appearance is generally two or three days after parturition, the first thing observed being the unsteady gait followed by dropping to the recumbent position. The animal is very restless, tries to rise but is unable to do so, stretches herself, and sometimes groans out. Very soon she begins to blow hard, the fever runs high, pulse up to 100, dry muzzle and hot horns. Her brain becomes affected, and this appears to be due to the total suspension of the bowels and kidneys. When no check is brought into play in the shape of medicine, these symptoms become alarmingly increased, and so rapid is the development, that they may run their course in from twelve to sixteen hours after the first appearance, terminating fatally. The cause, as borne out by

the *post-mortem* appearances given by careful operators, is clearly due to the exciting act of parturition. The vessels which go from the uterus are particularly involved, the inflammation sometimes extending all over the peritoneum. Whether hard driving or jostling during transit in railway trucks previous to calving may lay foundation for many cases, by disturbing the balance between the maternal and fœtal circulation, is a question I think worth more than a passing thought. The veins contain large quantities of broken-down lymph, and this is seen not only on the surface of the uterus, but all over the intestines and sometimes extending even to the thoracic cavity, whilst in most fatal cases a large effusion of watery serum is found in one or both cavities. I offer no opinion myself as to whether animals slaughtered during the parturient period for this or any other affection are fit for human food, but I invite the opinion of this meeting in any discussion which may follow on the point. The treatment of this complaint consists, in my opinion, to use a vulgarism, "to go the whole hog at once." If called in before the animal is off her legs, bleeding pretty freely may be useful, but as soon as the effusion stage of the peritoneal inflammation sets in, bleeding is out of the question. Large doses of purgative and diuretic medicine are indicated, and Tinc. Opii and calomel are useful not only to relieve pain but to stop the effusion. As getting the bowels to act speedily is very important, half doses may be repeated every four hours, but unless the symptoms are diminished in twelve hours, any treatment we may adopt will most likely be futile. Clothing the body and packing with straw to excite skin perspiration, are good adjuncts in the way of relieving internal congestion and checking the fever. This, with either ammoniacal blisters or hot water to the abdomen, is about all that suggests itself to my mind. Some gentlemen may have something better, and I shall be glad to hear it expressed in the discussion.

The last of the diseases connected with the parturient period which I shall bring to your notice also goes by the common term, "Milk Fever." This is the very fatal disease going under the designation of *Puerperal Apoplexy*. This affection, as most of you are aware, is confined to the brain and spinal cord, the internal viscera being mostly healthy. It comes on generally from twenty-four hours to two days after calving. Heavy-bagged, elderly cows, full of condition, especially in the summer months, are most subject to it; while bad milkers are generally exempt. It runs its course very rapidly; often five or six hours from the first observable symptoms, send the cow to her doom. The complaint, in my opinion, is a very fatal one, more especially when it comes on soon after parturition, and one remarkable fact is that it is seldom seen in cows before the third or fourth calving. The first observable symptom I have noticed is defective peristaltic action of the bowels. The fæces come away in small pieces, and the force is so weak that it slides down her thighs, and over the hocks. The lactiferous secretion is diminished but not entirely suspended, and she both eats food and chews her cud. In the course of an hour or two she becomes restless, staggers in her stall, and finally gets down. All the secretions are now arrested; the pulse may be quick and strong; she begins to dash her head about, moan, and soon becomes comatose, insensible to any external irritant. The pulse gets small and weak, eyes glazed and of a leaden hue and the head drops back on one side. These shortly are some of the more prominent symptoms, and the cause, I think, rests in the superabundant vascularity of the whole system, and the act of parturition, which destroys the balance or equilibrium. Eminent pathologists who have made *post-mortem* appearances a study, tell us that the external surface of the brain is unnaturally red, and that the ventricles contain a muddy fluid, and this exudation is seen at the back of the brain, and also in the spinal cord, especially in the lumbar region. The digestive organs are perfectly healthy, but there is slight congestion of the lungs. From the rough *post-mortems* I

have made I can confirm most of this, but I have observed that the congestion of the brain is attended by actual rupture of the minute capillaries, leaving clots of blood larger than a pea on the surface, with other appearances of a decidedly inflammatory character. As to treatment I think the question resolves itself into the means of prevention more than that of cure. We should encourage our clients to diminish the vascularity of the system of such cows, as we know them to have and which we consider dangerous. This is effected by giving a good dose of purgative medicine a few days before calving. If we are called in at the very onset of the first symptoms, before the cow gets down, bleeding may be of service, but after the comatose stage has set in it is useless and does harm. Powerful stimulants, as whiskey, or Carbonate of Ammonia, combined with purgatives and diuretics are indicated, cold water to the head, and Linimentum Ammonia applied to the whole length of the spine, the udder to be drawn frequently, and she should be clothed up and packed with straw. If the case is to terminate fatally, it is seldom one can administer a second dose without danger of choking, as she loses all power of deglutition. The favourable reaction consists in copious sweating, movement of the bowels, and well-marked head-relief, but upon the whole the treatment is unsatisfactory, and it becomes a point for those practitioners who consider that a cow seized with *puerperal apoplexy* is or is not fit for human food to act and advise as they consider right.

Red Water.

In regard to this disease, it seems to attack animals under very different conditions as to age, sex, and the general management of stock in different counties in both England and Scotland. For instance, in many parts of Scotland, I am told, it generally occurs in cows about a fortnight calved, but as I have had no experience of a cow in my district ever being attacked after parturition, I will not dwell on the causes which are said to operate in producing it, but leave that consideration to gentlemen from over the border, who are experienced in the matter, to ventilate in the discussion to follow.

Red Water, then, in England attacks both young and old of both sexes indiscriminately. The causes which operate in producing the disease, in certain farms and pastures, may be said to be of an indigenous character, and depend altogether on the presence of some noxious ingesta, but whether the deleterious agent is to be found in the nature of the herbage, the quality of the water, or the leaves of certain trees and shrubs, I cannot say. No doubt cases occur which might add colour and strength to any one of these views.

This is all I can say about the causation, and as it is the last subject in my paper, I propose to go a little deeper into the pathology and symptoms than I have done in the previous ones. The first thing generally noticeable is the colour of the urine, which assumes a pinky colour, but we are seldom called in till the urine has become quite red, or further, black, like venous blood. It might be naturally expected that if bleeding from the kidneys or from any other organ connected with the urinary system, was the cause of the red colour, blood globules would be found in the urine, but pathologists say there is no such thing to be found in any stage of the disease, but that the urine contains a large quantity of albumen, and the quantity increases as the colour deepens, and we are told also that the urine contains an increasing quantity of iron, also a deposit of epithelial scales. I need not tell you that healthy urine contains none of these substances, and as for the last, it may fairly be assumed that they come either from the kidneys or from the bladder. The question is how, and from what source do albumen and metallic iron find their way into the urine? In attempting to answer this

question, I am partly guided by others who have made experiments, not only with the urine, but with the blood during the disease. As you are aware, healthy blood contains large quantities of equal biconcave discs, or blood corpuscles of uniform size, about $\frac{1}{3000}$ part of an inch diameter. In the blood of an animal suffering from this complaint, these blood globules are not only reduced in size, but irregular in shape, due to a portion of their constituents having exuded into the Liquor sanguinis. This, of course, causes the corpuscles to collapse, hence the irregularity of their outline, and as one of the constituents of blood globules is metallic iron, and this being found in the urine in abundance, it is concluded that in the first place, it is exuded into the Liquor sanguinis, and afterwards eliminated by the kidneys. But before this could occur, it is considered that an important change in the density of the blood must have taken place. It is thought that at the first commencement of the complaint a large quantity of albumen is by some means or other abstracted from the Liquor sanguinis, thus reducing its specific gravity as a floating medium, and as a consequence, collapse of the capsules, and an escape of iron takes place, which ultimately, through the natural filter, the kidneys, finds its way into the urine, thus giving it the high colour. This is borne out by the large quantities of albumen found also in the urine, and also the greater the quantity the darker the colour, till it becomes in the latter stages like black water. I have already said that the cause of this complaint is in England clearly proved to be due in a great measure to some noxious agent, which either grows on certain land or exists in the water which the animals drink. The question is, does this agent act as a direct poison, or by locally producing such an amount of super-diuresis as to lead to degeneration of the kidneys? In considering these views it is necessary to consider for a moment what views experimental pathologists hold in the matter, and in this we are told that *post-mortems* revealed the fact that the kidneys exhibited a great want of firmness, and that the uriniferous follicles are very much thinned. This suggests an idea that the complaint is localised to these organs, but again it is argued that the same condition of the kidneys is found under other circumstances where no red urine is secreted. Consequently it would not do to conclude that Red Water is due to degeneration of the kidneys. In favour of the toxic agent, whatever it may be, I would suggest that it acts generally by causing such a derangement of the blood as to cause a separation of the albuminous constituents, and the kidneys become positive agents in eliminating it in an excretory form, and that the colour of the water is solely due to, and intensified by, the amount of iron which escapes from the shrunk globules, and exudes into the Liquor sanguinis. I may be excused if I point out, on the authority of various pathological authors, that any deviation from a relative fixed standard in the principal constituents is productive of disease. In the blood of a healthy animal the gauge is laid down as follows:—In 1000, Fibrin, 2 to $3\frac{1}{2}$; Corpuscles, 110 to 150; Solids of serum, 72 to 88; Water, 760 to 815 = 1000. Thus it will be seen that in Red Water there is a great change in these constituents, and disease is the result. How far the microbe theory may be applied to this disease I am not aware, but in the rage for elucidating the causes of disease by these thread or rod-like bodies, there does not seem to be anything new. Obermeyer, Russ, Stucker, and Dr. Carpenter all have observed them and made comments on them years ago. Shortly, the symptoms are: the animal presents a dull, emaciated appearance, hair on end; animal perhaps will lie for a whole day, often near the middle of the pasture. On approaching, you notice an irregularity in the heart's action shown by a regurgitation up the jugular and hard beating. When the urine begins to assume a black colour, the animal breathes heavily. This is due to thinness of the blood and approaching emptiness of the blood-vessels. She

at this stage loses all power of locomotion, and after this, death soon intervenes. When observed more closely at the commencement the bowels are seen to be relaxed, and this relaxation is followed up by obstinate constipation. As to treatment there is a variety of opinions, but I find, as a therapeutic agent, nothing is comparable with Chloride of sodium as a basis, with Hydrarg. sub. chlor. and some carminative as adjuvants. Half doses to be repeated every eight hours, if necessary. When purgation takes place, the urine generally begins to clear, but not always, when small doses of Ol. tereb. may be given every three or four hours till the desired effect is established. The subsequent debility is overcome by administration of vegetable and iron tonics and stimulants, with good food and nursing. On the whole the disease is not a very fatal one, if we are called in at the onset; but, if not called till the vessels are nearly empty, there is only one termination.

Gentlemen, this concludes my paper, and I have now to invite your free discussion, and if you come to the conclusion that the text of this paper, or any part of it, is based on an erroneous hypothesis, to give expression at once to your views; and don't mind my feelings in any way.

The CHAIRMAN: The paper you have just heard from Mr. Harrison is a very elaborate and excellent one, any part of which would give ample scope for discussion. I invite the gentlemen present to give their views on the subjects.

Mr. THOMPSON: I have had very great pleasure in listening to Mr. Harrison's paper. It is a very good one, especially for country veterinary surgeons. (He discussed Mr. Harrison's remarks at some length, and described cases in which he had had great experience.) Mr. Harrison did not believe in using instruments, he seemed to manipulate with his hand much better; but Mr. Thompson said that he had found an instrument most useful, and had had one made especially to operate on animals which were afflicted with a collection of fluid in the uterus, such as Mr. Harrison had described in the first part of his paper. Mr. Thompson described his mode of operation in these particular cases. As a rule, animals afflicted with this disease showed signs of it about ten days to even six weeks after being bulled, but it had occurred in his practice once in a heifer ten months old, which had never been near a male animal, and in this case the secretion was of a whitish colour; and where they have had connection with the male the fluid was generally of a brownish colour. This is a subject of very great importance to country veterinary surgeons. In some parts of the country, and in towns, the disease is totally unknown; so for that reason we are very much indebted to Mr. Harrison for bringing the subject forward.

Mr. POTTS said that he had had great experience in the particular disease which Mr. Harrison had pointed out in the first part of his paper. Mr. Potts was of opinion that medicine was of no use at all; tapping was the best means to adopt, and this he did by means of an ordinary trocar and cannula, per vagina, and in some cases where the fluid did not come away freely he left the cannula in.

Mr. ASHLEY asked Mr. Thompson if he understood him to say that it was the Os uteri that he tapped.

Mr. THOMPSON said that it was.

Mr. ASHLEY was of opinion that it was the impervious hymen.

Mr. ARMSTRONG said that he quite agreed with Mr. Ashley that it is not the Os uteri which is tapped, but an impervious hymen, which could be felt on examination of such a case, by the vagina, as a fluctuating tumour, and of different character altogether to the Os uteri; and what was more, the operation would not be so easily performed if it was the Os uteri which had to be operated on. When the instrument is introduced into the vagina very little pressure is needed in most cases to tap them. Then, again, I am of

opinion that if the os of a young beast was operated on in such a manner, the results of the operation would be of a more serious character than what we are accustomed to meet with.

Mr. ASHLEY said you are unable to feel the os until you break down the partition just referred to.

Mr. CARLISLE: I have seen a good many cases of this complaint, and operated on as many as I have seen; the cause of the disease was enclosed in a sack and not in the body of the uterus at all. Mr. Carlisle was of opinion that the trocar and cannula exhibited by Mr. Thompson was not even large enough to do the operation properly; because if you make a good large opening you have no trouble of repeating the operation. It happens that you are never called in to operate on a cow that has had a calf; it is always in a young female, such as a heifer after its first bulling. The operation is simple enough; the thing is, How do we get this secretion, and how is it brought about?

Mr. HARRISON: Mr. Carlisle wishes to know the cause of this collection of fluid. Female animals of the bovine type have periodical discharges every three weeks during the œstral period, and when there is closure of the os or vagina there is no escape for the fluid, and the animal coming in heat for say twelve months, a large collection of menstrual discharge is accumulated, and that is the cause of the complaint.

Mr. CARLISLE said that in France the operation was performed by making an incision through the rectum into the sack, but he was not in favour of the French mode of operating in this particular instance.

Mr. CARRUTHERS said that he was satisfied that the collection of fluid was in the womb.

Mr. DONALD: There has been a good deal said about the operation for the relief of these cases, but that is a simple matter. The main thing to be got at was the cause, and if we look at the anatomy of the generative organs and consider the physiology of menstruation, he thought that we were able to satisfactorily explain all these cases, the source of the collections and their retention. It is a condition commonly met with in rural practice, and in the majority of cases, the obstruction was the imperforate hymen, and not the Os uteri, which was usually operated on—at least it had been in those which he had operated on. He was of opinion that it would be a very difficult thing to operate on the os in a young heifer, in the way that had been described. He also contended that he had known heifers conceive and bring forth naturally after the operation, and he had also known cases relieved spontaneously by paining.

The CHAIRMAN: I have not seen so many cases, and my experience is that the collection is not in the uterus, but within the vaginal walls, and in each case I opened them with my finger, and the fluid came away. He said he could not understand how there was so many more cases in Cumberland and Westmoreland than in Scotland. He had not seen anything like the number of cases which appears to be general here. He was also of opinion that it would be an impossibility to operate on the os with the ordinary trocar and cannula, as they were not of sufficient length to reach the os, and penetrate through it into the uterus.

Mr. THOMPSON said that Mr. Harrison was very elaborate on Milk Fever, giving No. 1, No. 2, and No. 3 kinds. We old practitioners have seen all these cases, and I have never seen them divided so naturally before as Mr. Harrison has done to-day, and as for the treatment we had better say little about it.

The CHAIRMAN: There is no doubt but that this is also a very important subject, and Mr. Harrison is right in his subdivision. We have simple Milk Fever, which is not difficult to treat. Apoplectic Fever is the one which gives

us all the trouble, and successful treatment of this seldom happens. The urine ought in all cases to be carefully taken away with the catheter; the animal ought not to be allowed to lay on its sides. It ought to be propped up; if not, flatulence takes place, and the animal gets worse. Severe purgatives have never been successful with me. Many years ago the late Mr. Greenes, instead of applying mustard, etc., to the spine, used to iron their backs with the ordinary flat box-iron.

Mr. THOMPSON: Has any gentleman tried the thermometer in these cases? I believe I am right in saying that the thermometer does not rise in these cases, therefore there would not be any increased fever. If you put the thermometer at 95 degrees F., it may rise to 97 or 98, but in none of the cases does it go above the ordinary temperature.

Mr. DONALD: My experience in regard to the thermometer agrees with Mr. Thompson. I have often seen where a case looked very hopeful, and after a good dose of salts it rapidly became insensible, and never rallied more. Once they become insensible I cease giving medicine, and in these cases I always use treacle as a purgative instead of salts.

Mr. CARLISLE: I daresay that you will all have found cases where you could not safely administer anything without the air of the stomach pump. In one case I cut into the rumen of a cow and put the medicine directly into the stomach through the opening with a cannula, and in two days she was well again. The most important thing in treatment is the use of good stimulants and strong counter-irritants to the spinal column.

Mr. ASHLEY said that in two cases he had administered medicine through the cannula directly into the rumen, but he found the gas very troublesome.

Mr. CARLISLE said that he had found the same thing.

Mr. THOMPSON said, in his opinion, Milk Fever was due to a succession of shocks to the nervous system, and mentioned the fact that, taking all the milk away at once was a great shock, and he knew one very large dairy where the cows were only partially milked, and several times a day, until all danger of Milk Fever was over, and this was tried as a preventive with the very best results.

The CHAIRMAN said he agreed with Mr. Thompson with regard to the milking, and he thought the disease would be easier dealt with if owners could be persuaded to change the diet a few days before calving, and limit the animals to linseed cake, bran, and dry straw, and stop the use of all succulent and green food, or food of a fermentable character. My opinion is that the excitement of calving causes the digestion to cease, and then fermentation sets in very soon, and the action of the stomach on the brain is very great.

Mr. DAWSON said prevention was the gist of the whole thing, and that recommendation ought to be given to the owners to have a veterinary surgeon called in, to advise as to their proper treatment before calving.

The CHAIRMAN said with regard to abortion he was very much inclined to think that it was possible for the germs producing abortion to be transmitted from the male into the vagina of the female, and thereby cause the female to abort.

Messrs. DAWSON, CARLISLE, and COATS also expressed their views in accordance with the Chairman.

The CHAIRMAN then moved a vote of thanks to Mr. Harrison for his very able and elaborate paper. Many points in Mr. Harrison's paper have been put to one side, though equally interesting. Matters had been mentioned that day, which would have the effect of compelling him to turn his attention in their direction; they are worth close investigation.

The motion was put to the meeting and carried unanimously.

A vote of thanks to the Chairman concluded the meeting.

JOHN ARMSTRONG, *Hon. Sec.*

SOUTHERN COUNTIES VETERINARY MEDICAL ASSOCIATION.

THE quarterly meeting of the above association was held at Laker's Hotel, Red Hill, on Thursday, July 30th, when a most interesting paper was read by Professor Penberthy on the subject, "What is Known as to the Relationship of Scarlatina in the Human Subject to Disease in the Cow." The chair was taken by Mr. J. D. Barford, of Southampton, the President, and there were also present, Messrs. E. A. Hollingham (Hon. Sec.); Legge, Dorking; J. B. Martin, Rochester; F. W. Wragg.

Letters of apology for non-attendance were read from Messrs. Raymond, Price, Rock, Morgan, Holman, and Sir Henry Simpson.

Mr. Herbert Davis also wrote to the effect that, owing to severe illness during the last two years, and having sold his practice, he regretted to ask that his name should be taken off the list of subscribers—at least for the present.

The meeting accepted the resignation with extreme regret.

The HON. SECRETARY next read a letter from Mr. Cox, thanking the Association for the compliment they had paid him in re-electing him as a member of the Council, and stating that he appreciated highly this farther acknowledgment that his services in the interest of the Royal College had met with the approval of so many of his professional brethren.

Mr. WRAGG verbally tendered his thanks to the members of the Association for their kind support at the last election of the Council. He assured them that the best interests of the profession would always be studied by him, and he should vote for those measures which, in his humble opinion, would tend to raise the status of the profession, and be for the benefit of his professional brethren.

The PRESIDENT said that, before they proceeded with the business of the meeting, his first duty—and a very pleasant one it was indeed—was to tender them his heartfelt thanks for the great compliment they had paid him in electing him as their president for the second time. They would bear him out—those who were present—that he made a very strong protest that he should not again be nominated, feeling as he did, and he felt so still, that he was keeping out of the chair another who was quite as capable of filling it as himself; in fact, there were several who were quite as able as himself of taking the chair. At any rate, from pressure and the very kind and unanimous vote given, he felt he could not refuse the compliment which they chose to pass upon him. That circumstance brought him to the position which he held that day. He certainly very much regretted that, at the first meeting of their second year, there should be such a paucity of attendance, but he presumed that, as they found was the case in the South of England, members were so scattered, and circumstances cropped up from time to time, that kept them from attending the meetings, although they had selected that place as being a central one, and easy of access to members between there and the coast, and from London and other parts. But however small they were in numbers, he trusted that the same views actuated them as in the past, and that was to uphold the principles of the Association, and advance the interests of the profession in any little way they could. It had been the custom generally for the President to give a set address on his election to the office which he held, but he ventured to think that to deviate occasionally from that course was probably a wise consideration. They were not met there to hear any set address from the President, inasmuch as Professor Penberthy had kindly acceded to a request he made to him a month or two ago, that he should give them an address on some subject he might choose, and he (the chairman) ventured to suggest the subject which he had proposed for their discussion that day, seeing that latterly in the London press it had been causing some anxiety and some discussion between the medical profession and themselves.

They were met there that day after the result of a very auspicious occasion. He felt extremely strong in his loyalty to his Sovereign, and that was the first opportunity they had had since the events in London and the provinces of the previous week of mentioning, as members of the profession, the auspicious event which had taken place. He repeated that he felt most strongly and most grateful when he said that the events of last week had shown to him, as he had no doubt that they had shown to all loyal and true subjects of their Sovereign, that there was that loyalty and affection for the throne in England which they all so much admired and desired. (Hear, hear.) It had been the custom wherever any society or body of Englishmen had met lately to take a review of their proceedings during Her Majesty's reign, and if they would allow him he would just take a brief retrospect of their doings in the Association during the past year. At their first meeting he was elected President, and they did him the honour of assembling at his native town. He was delighted to see so many members of the profession assembled to do him honour, and he was glad also that some of the chief members of the medical profession, whom he invited, responded to the invitations. He hoped they passed not only a very enjoyable, but also a profitable afternoon. It was only for him to remind them that they had an interesting and instructive paper from their late president and chief, Dr. Fleming, on the subject of Rabies. Their second meeting was at the First Avenue Hotel, when Professor Robertson read a paper, which was also of a very interesting character. A few months ago, at Lewes, Professor Duguid was good enough to give them a paper on the progress of the profession during the last fifty years; and he thought, taking it altogether, that the year's work of the Association had been instructive and interesting. He did not know that anything very special had occurred outside the Association, which would call for any particular comment. One little incident, probably not of a very pleasing nature, occurred in Edinburgh last winter, which he might allude to, but he trusted that the dispute would be amicably settled, and that the discussion and publicity it had caused would prevent its recurrence. Then there was another matter, as he recently observed, which had caused considerable discussion, viz., the diseases which were communicable from animals to man, and back from man to animals, to a certain extent, for that was the theory which had been advanced; and acting on that, was partially the reason why he suggested the subject to Mr. Penberthy for their discussion that day. Experiments were now being carried on, and he could not help thinking that the communicability of Scarlet Fever from the cow to the human subject through the milk supply was of national interest, and could not be otherwise than interesting to them as a profession, as well as the medical profession, especially when he saw by a lecture given before the Royal Institution a little while ago, that the veterinary profession were accused of apathy, and of not taking their part in so important a subject. For that reason he had asked Professor Penberthy to bring the subject forward. (Hear, hear.) The President, in conclusion, read a letter from Mr. Edgar, of Dartford, who forwarded a patent pad shoe, which, he said, had been invented by a Dartford farrier. The writer added that it possessed all the advantages of Sheather's pads at about half the cost, and could be cut to fit the smallest foot. The price of the sample forwarded was two shillings per pair.

A slight discussion ensued upon the merits of the new patent, which was not very favourably received, preference being given for Sheather's shoes.

On the motion of Mr. HOLLINGHAM, seconded by the PRESIDENT, Mr. King, Tunbridge Wells, was nominated a member of the Association.

Professor PENBERTHY then proceeded to read his paper, which was as follows :—

Some two or three weeks since I received from your President a request to bring a subject before this meeting. Following this came a suggestion that a short paper on the above might prove interesting. My compliance with this request must not be regarded as evidence of the possession of any special knowledge of the subject or superfluous time for special preparation. My apology for presuming to occupy your time must be my regard for the great importance of that aspect of our professional work which includes the conservation of public health. The security of society is the aim of all well-directed human effort, and there must be a definite relation between the social status or public appreciation of an individual, or collection of individuals, and the share taken by him or them in the perfection of that state of security. The diffusion of light by experimental research among the causes of disease appears to me to show that means at the disposal of the veterinary profession are of increasing magnitude, and it behoves us, gentlemen, to carefully prepare ourselves for their proper use. Knowledge respecting the communicability of disease from the lower animals to man, I hope, we all regard of paramount importance. It does not, however, seem that this regard is generally realised, for, in course of a recent lecture by Dr. Klein at the Royal Institution, that scientist took advantage of his position to state, "Judging from the attitude of the veterinary authorities, I am afraid the veterinary profession has not yet grasped the full responsibility that rests on them, both towards the general public and the dairy farmers. That the disease in the cow which I have described to you is as yet unknown to the veterinary profession does not do away with the existence of such disease, and I venture to say that, being as yet unknown to and unrecognised by them, should be so much more stimulus for their trying to recognise it." These remarks elicited signs of approval from his audience, and in course of a day or two were followed by a letter to the *Times* from Dr. Seaton, who stated that the "attitude of the professors of veterinary science was opposed to the scientific study of the Cow Disease." This charge I thought likely to produce an unfair impression, so I challenged it in a communication to the same paper. It has not yet been replied to. I mention these matters for the purpose of indicating a certain disposition to depreciate the value of our professional services, and the great necessity for inquiry and observation by us on such points. The object of the following remarks, on a subject which has, during the last few weeks, so engaged the public mind, is to elicit the experience of members with this Cow Disease and any relation of it to human disease.

With our present knowledge of specific diseases, including a recognition of the multiplying power of the disease-producing factor, it could scarcely be doubted that Scarlatina of the human subject was due to a microbe. As long ago as 1872 McKendrick described a micrococcus, and from this time to the present various observers have identified micrococci, and even bacilli, with the cause of the affection. Notwithstanding the fact that milk was often the accredited carrier of the morbific agent, I am not aware that, until 1882, any strong view was expressed as to other than a human source of infection. In this year Dr. Buchanan, in a report to the Local Government Board, gave it as his idea that milk may not always be contaminated from the human subject, and says that a definite disease was producible in the cow by means of scarlatinal infection, producible most readily when the cows were in milk. Among the most interesting characteristics of this disease was its quality of communicability from one animal to another by inoculation. In 1885, Dr. Power stated that he believed the disease (Scarlet Fever in human subjects) belonged to the constitution of the cow.

The position now maintained by the medical officers of the Local Government Board appears to me to be that a comparatively mild disease of the cow is capable of producing Scarlet Fever in the human subject. Scarlet Fever

prevails in England perhaps more than in any other country, and causes the highest mortality of any epidemic disease.

As far as I know this condition has not been recognised by the veterinary profession; it is certainly incumbent on us in conjunction with any and every other body to prove or disprove its existence.

As most of us are aware the present manifestation of public interest in the matter accrued to the report of the lecture of Dr. Klein before referred to. The investigation of an outbreak of Scarlatina in certain districts of London by Mr. Power, Inspector of the Local Government Board, led that gentleman to the apparently inevitable conclusion that the virus of the disease was distributed with milk among the customers of certain dairies. Farther inquiry appeared to exclude the possibility of the said milk having been contaminated from a human source. Results of previous investigations in human Scarlatina having a similar bearing, attention was directed to the cows supplying the dairies whose customers were affected. It was found that a disease of the teats existed on the farm, and Mr. Power's report invites the conclusion that these affected cows supplied the contamination. In his own words, "that the influence belonged to the constitution of the cows; was, in fact, some species of cow disease," and it was very probably an infective disease communicable from cow to cow.

The services of Dr. Klein were now sought to study the nature of the cow disease.

This observer visited the affected sheds at Hendon on December 31st, 1885, and found the disease very general. He thus describes the condition in the cows:—"The animals looked thin, but not strikingly so, excepting in one or two cases of animals that had only a few weeks ago been admitted to the place, and which, therefore, had calved comparatively recently. As regards the feeding capacity of the affected animals, their milking power, and their body temperature nothing abnormal could be detected.

"As a rule, *i.e.*, in most animals, the disease affected the teats, but in some there was also on the lower part of the udder here and there an ulcer. In such animals patches denuded of hair were noticed on various parts of the skin, the tail and back particularly. In these parts the epidermis was scaly, and the cutis more or less thickened. On the teats and udder were several flat, irregular ulcers, varying in diameter $\frac{1}{4}$ to $\frac{3}{4}$ of an inch: some more or less circular; others extended in a longitudinal direction on the teat. The ulcer was covered with brown or reddish-brown scab, which, when scraped away, left exposed a granulating, slightly indurated base. The margin of such ulcer was not raised, nor was there any perceptible redness of the skin around. In the earlier stages, 'a small vesicle made its appearance on a greatly swollen and red teat, in course of a couple of days assuming the character of the above ulcers. In another cow an ulcer, about $\frac{1}{2}$ inch in diameter, in its centre was becoming covered with a scab, while at its margin vesiculation was distinctly visible.' It mostly affects the teats.

"A cow brought to the Brown Institution, whose ulcers were at fullest development on 4th January, was killed on 9th January, the sores then decreasing.

"Both lungs exhibited on the *upper posterior lobes* numerous petechiæ under the pulmonary pleura, the peripheral lobules of these parts being much congested. There were numerous adhesions by recent soft lymph between the lower lobes of the lungs and the costal pleura, particularly laterally.

"In the liver there were several reddish streaks and patches reaching from the surface of the organ to a depth of about $\frac{1}{4}$ of an inch. In these patches the liver tissue is much softened. The spleen and kidneys, with the exception of slight congestion, appeared normal. In the placenta there were numerous petechiæ.

Speaking of another cow, killed on 12th March, Dr. Klein says:—"For some days previously the animal had been getting very thin, notwithstanding its ravenous and excessive eating.

"*Post-mortem.*—In the lungs numerous lobules, especially in peripheral parts, which showed great congestion. There were in addition pleural adhesions, the cortex of the kidney was congested, but its medulla was pale."

Section of the ulcer was like that of Sheep-pox, but with less infiltration into the corium. Microscopic examination of the liver showed smaller or larger foci of inflammation, small cells, numerous diplococci and short coccus chains surrounding the inflamed areas. Kidneys showed well-marked Pomerulo-nephritis.

With scrapings of the ulcers, taken during life, four calves were inoculated in the skin of the groins and ear. In course of four or five days swelling and imperfect vesiculation had taken place about the spot of inoculation; within eighteen days healing was complete. Ten guinea-pigs inoculated at same time gave negative results, and one out of three dogs showed a vesicular eruption.

Search, by means of microscope and culture of material from ulcer of the cow's teats revealed to Dr. Klein micro-organisms, spherical bodies arranged as diplococci, and as shorter and longer, straight, wavy, or curved chains (streptococcus). This microbe was similar in physical properties, and in cultural characters, to one found in Foot-and-mouth Disease, but differed from the latter in the fact that when cultivated in milk for two days at 35°C., the milk was turned completely solid.

Inoculation of a calf with cultivation of this streptococcus was followed in twenty-six days by death. We find no description of the condition of the animal during life. *Post-mortem*—appearance of subcutaneous tissue at seat of inoculation, the inguinal glands, peritoneum, liver, kidneys, ileum, mesenteric glands, lungs, pleura, bronchial glands, pericardium, and throat indicated severe vascular derangement. The hairy parts of the skin were not examined.

At the same time another calf was inoculated. We get no description of it till nearly five weeks after, when we learn there are "around the nostrils and lips of the mouth numerous irregularly outlined patches, not raised above the level of skin." These patches had a discoloured, brownish, very slightly raised margin, and a paler centre; they were round or irregular, some as small as $\frac{1}{8}$ of an inch, others four to six times as large. This calf was killed on the day following the above discovery, and visceral lesions similar to, but less severe than in the former calf were found. Cultivation of heart's blood yield a growth of streptococcus, in all respects identical with that before described.

From the foregoing the deduction is made that by inoculating material from the ulcer of the teat of the cow into the skin of the calf, a local disease identical with that of the cow is produced; while cultivated virus injected subcutaneously sets up a general disease, resembling, to a considerable degree, in its anatomical characters, human Scarlatina.

One experiment, though not conclusive, tended to prove that the virus was not contained in the milk uncontaminated from the teats. A second experiment did not confirm this view. Milk was a very suitable soil for cultivation of the virus.

Having further prosecuted his study of the micrococcus, Dr. Klein in his lecture on 29th May last announced that "this microbe (Micrococcus Scarlatina) is the cause of human Scarlet Fever; further, that it produces in bovine animals a disease identical with the Hendon disease and Scarlet Fever, and that consequently while the cow is susceptible of infection with human Scarlet Fever, it can in its turn be the source of contagium for the human species, as was no doubt the case in that epidemic from the Hendon farm."

Micrococci apparently identical have been found in and cultivated from condensed milk (of the Rose Brand). From the blood of a monkey, said by Dr. Klein to have died of Scarlet Fever, the same micrococcus has been obtained.

Following closely on the delivery of Dr. Klein's lecture came the publication of some experiments by Drs. Jamieson and Edington, of Edinburgh University. The observations of the former were of a clinical character, mainly tending to prove the position of the virus of Scarlet Fever in different stages, and suggesting measures for curative and prophylactic treatment.

Dr. Edington, studying the disease from a bacteriological point of view, found eight different kinds of microbes, two only of which when inoculated into rabbits, guinea-pigs, and pigs, were capable of producing marked change. One of these, a diplococcus, produced some erythema. The other a bacillus, which, "when inoculated into rabbits and calves, is capable of producing a disease in all respects identical with Scarlet Fever in the human subject." Referring to some inoculated calves, Dr. Woods expressed his conviction that the disease which these calves suffered from, as the result of the inoculation with the bacillus, was Scarlet Fever, and not any mere septicæmic or erysipeloid disease.

It would appear, gentlemen, that the foregoing is the substance of what has been made known to the world concerning the relation of human Scarlatina to a disease of the cow. One observer of high repute states that Scarlatina in man is due to a streptococcus, and that the disease among cows at Hendon was due to a streptococcus; that inoculation with the streptococcus from human Scarlet Fever produces the same disease in the cow as the inoculation with the streptococcus from the cow disease; indeed, that they are one in microscopical, cultural, and pathogenic characters. The other observers, occupying good position and opportunity, assert that Scarlet Fever of man is due to a *bacillus*, which, when inoculated into calves, produces a disease identical with Scarlet Fever in man.

The Scarlatina of cows of Klein is a systemic disease so mild that neither milking power, appetite, nor temperature is disturbed. *Post-mortem* appearances of animals killed after inoculation with material taken directly from the ulcers are described on the lines of those of human Scarlet Fever, but their mildness does not convey the idea of a striking likeness. Degree is at least different, but we must not forget that these cows and calves were killed, and did not die naturally. There is no evidence of sore throat mentioned. Squire: 111 with recovery, 115 fatal. In human Scarlatina the phenomena of fever are marked, and according to Squire, sore throat is always present. Indeed, the similarity between the condition described by Klein in the cow, and human Scarlatina as witnessed by myself, and described to me by specialists, is by no means striking. One peculiarity of the narrated experiments of Dr. Klein is that four calves inoculated with material direct from the diseased teats of the cows are described as having suffered from the same mild disease as the cows supplying the virus; while two calves inoculated with a cultivation (third day sub-culture) engendered a severe disease. One of these calves succumbed in twenty-six days, and *post-mortem* examination showed extensive and well-marked visceral disease. The other lived thirty-four days (no symptoms till now in either case being mentioned in the report) when an eruption about the mouth was noticed. When comparing the severity of this latter disease with the mildness of the former four, it is somewhat surprising that no symptoms are mentioned till thirty-five days after inoculation. Much stress seems to be laid on the appearance of the nose and lips of this latter case, which, judging from the description of Dr. Klein, I believe is not at all uncommon in calves, while it is only in this one case out of six inoculated that such lesions beyond the seat of inoculation are described. It is

certainly most peculiar that cultivation of the streptococcus should at once have the effect of increasing its virulence and shortening its incubation period.

We are told, too, that the streptococcus was in the blood or cultivations of it. This must be considered evidence in support of the view of identity of the disease in the six calves and *ceteris paribus* of human Scarlet Fever.

One matter of circumstantial evidence is wanting, viz., the production of Scarlet Fever in the human subject by inoculation with matter from the ulcers or cow's teats. This, as a result of direct experiment, of course we are not likely to get. The Scarlatina of calves of Dr. Edington, on the other hand, is a markedly febrile acute disease, as, according to Dr. Woods, presents many of its ordinary features during life and on *post-mortem* examination. Time at our disposal will not admit of an analysis of Dr. Edington's report. One statement, however, is worthy of remark, and must carry some weight in the assessment of the value of experiments. The *rectal* temperature of the calf is put at 99·6, and this twice in one day. The average of a large number of registrations of my own is 102·1, while in no case was one lower than 101·8.

Writing in 1883, Dr. Squire states "that in no case has any diseased state of the cows been discovered to exist." From this it is evident that the possibility had been recognised, and the cow disease sought for in connection with outbreaks, and had compelled the conclusion that milk was merely the medium of conveyance of the human virus to suitable situations. Now the public are confronted with the view of a great experimenter that the cow is the subject of Scarlatina, and a producer as well as distributer of its producing factor. The position is to our profession a most important one. Should further observation and experiment verify Dr. Klein's conclusions, our function in relation to the conservafion of public health must become enhanced, and means adopted for dealing with the disease at its source. If it be proved that a "Cow Scarlatina" possesses the characteristics pertaining to most specific contagious diseases, one attack is likely to give immunity for a longer or shorter time. And as the disease in the calf is of so mild a type, the compulsory inoculation of all heifer calves should be a matter for consideration.

Whether the communicability of the disease from the lower orders to man be merely a hypothesis or an undeniable fact, duty compels us to make ourselves masters of the situation. To me it is a matter of regret that our knowledge of such subjects should be curtailed by a disregard of one branch of medical practitioners for the other. Experiments, as the foregoing, would, to me, be infinitely more valuable if an expert, with special clinical and *post-mortem* experience, were associated with the eminent bacteriologist and microscopist.

I will conclude these remarks, again expressing the wish that they may elicit the result of your experience with ulcerative disease of cows' teats, and any other information bearing on the subject at issue.

The PRESIDENT said that the subject certainly opened up a new era for them. He could not help thinking that the evidence must be confirmed by more facts before it could substantiate what Dr. Klein had laid down.

Professor PENBERTHY said he happened to be behind the scenes at most of what had been done in this matter, and so far as he was concerned, Dr. Klein's assertions would want a great deal of corroboration. A report had been issued by Professor Axe, who investigated the matter for the dairy farmers, but he (the speaker) did not say much about it, because it was really a general and not specific report. Dr. Klein, however, was dealing with a specific matter, and it was supposed to be the only thing known as to the relationship between Scarlatina in the human subject and disease in cows.

The letter of Dr. Seaton, an authority on vaccination, which was recently published, was severe on the veterinary profession. It suggested that the public were not to be dependent on them for information on such matters; in fact, the profession were not worthy of the position they should occupy, and were adverse to the study of that or any other diseases. He (the professor) sent a letter to the *Times* the day after, for the veterinary world was up in arms, but the *Times* was a long time before it accepted the letter, and eight days elapsed before it appeared. (Letter here read.) That letter had not been replied to, so that if there was any feeling, it had been silenced by it or something else. He had known Dr. Klein for a long time; he always fought a man, no matter who he was, so they must allow that for him.

Mr. MARTIN thought the matter should be discussed, and he should have regretted it extremely had he been absent that day. The subject was so important that their reputation was at stake, and it was essential that they should exert themselves to prove to the public that they were interested, and had some knowledge of bovine diseases. Milk was a very absorbing fluid, and he recollected a case where it had been in a dairy where there was Scarlet Fever in the house. The doctor asked him if he had any idea that the milkman in the neighbourhood had Scarlet Fever in his house, and by means of his milk was conveying the disease to the different people he served. He (Mr. Martin) could quite understand that. Last year, however, they had a case at Canterbury which was very important, and which had found its way into the public papers. It was alleged that the milk of a certain man's cows conveyed Scarlet Fever to different people who consumed the milk, and he (Mr. Martin), at the request of the owner, went and examined the cows. He went to his house first and ascertained that some members of the family had sore throats. He then went over his dairy, which was a model of cleanliness, and also the cow-sheds, the sanitary arrangements of which were perfect, and afterwards visited the marshes, where the water was obtained from a running stream. On examining the cows and calves he was unable to detect any eruption of the teats whatever. The calves were all perfectly healthy. He accordingly gave the man a certificate as to the result of his investigations, and it was published in one of the papers. That so roused the Corporation that they got their medical man to investigate the case, and they published his report, which stated that the man's milk had conveyed sore throats, and not Scarlatina, to the people he supplied in the district. This so seriously affected his business that it nearly ruined him. He (Mr. Martin) then wrote to the paper, offering the Corporation his assistance, but they took no notice of it. As far as Scarlatina went, they generally saw a redness of the skin, a sore throat, and a general fever; but he saw nothing of the kind in the man's cows, and therefore he did not think there was any similarity in the diseases in man and cows, but that Dr. Klein's assertions required greater corroboration than at present. (Hear, hear.) He did not believe in his report at all. He maintained that it was their duty to assist the scientific men at the College by all means in their power. If any case should come before his notice at any future time, he should, for the benefit of the profession and their reputation, seek the assistance of their professors to examine the case, and exonerate them from any blame that the public were likely to throw upon them. He was glad he came there that day, because the subject awakened them to further investigation. He claimed that they were really as anxious as the members of any other profession to enlighten the public as much as they possibly could to prevent diseases being communicated.

Mr. F. W. WRAGG said he should like to know whether Dr. Klein ever came across a case where the disease was communicated by any of the servants that milked the cows. It appeared to him that, if the virus from the teats would produce a disease similar to Scarlatina in the human subject, some

servant employed in handling the teats must, at one time or another, have been inoculated. To his mind, the great thing was that the constitutional disturbance in the case before them was very slight, and no symptoms were seen which were analogous to the symptoms of Scarlet Fever.

Mr. HOLLINGHAM said that the subject threw a flood of light on a case in which he was engaged only three weeks previously, where, he believed, the cow had the identical disease. There was the exact condition of the ulcerated teats and udder and bare patches on the skin. There was no alteration in the secretion or excretion, and the temperature was all right; but there was the eruption, and he was puzzled to account for it. The hair had come off, and the animal was licking the parts, as if they were irritated, and he simply gave, as they often did, a fever medicine, and recorded the complaint as some disorder of the digestive system. He went again in the course of a few days, and then found that the eruption had disappeared and the animal recovered. Two or three days previously that cow was being milked with a herd of fifty others in a large shed, and when he saw the case he regarded it as of sufficient importance to isolate it. He was continually handling the animal, and, having a small wound against one of his finger-nails, he used that finger; but he had suffered no ill effects from it. The place where the cow was was seven miles from Tunbridge Wells; there was no case of Scarlatina for miles round, and there had been no fresh purchase on the farm to his knowledge within two months. Therefore, if it was a case of the particular disease that he saw, he thought it was presumptive evidence that it was not such a highly contagious malady, even amongst cows, as it was sought to prove, and that it might arise independently of the existence of Scarlatina. (Hear, hear.) He should ascertain the names of the people in London who took the milk, and see if they had received any complaints from the people to whom they sold it. He thought that one case was interesting, viewing it from the light thrown on it that afternoon.

Professor PENBERTHY: Have you had Scarlet Fever?

Mr. HOLLINGHAM said he had it when he was a little boy. Before he arrived at the spot referred to the milk of the cow had been mixed with other milk. He was unable to say whether the cow had recently calved. The eruption had existed three or four days, and the milk had been used. He felt sure it was the identical disease, because the progress of it was exactly the same as they had heard detailed. It lasted a week or eight days. This was also a place where the highest sanitary conditions were in force.

Professor PENBERTHY: And so it was at Hendon, a medical man being appointed to examine every pan. Continuing, he said, they had now arrived at a state of affairs when they had to be emphatical.

The PRESIDENT said he could not allow the subject to pass without making one or two remarks, and he must repeat that he was not at all sorry that he suggested the subject to Mr. Penberthy. He had previously read Dr. Klein's report, and thought it to be of paramount importance to their profession and the public at large, and he was convinced in his own mind that the time had come when it must be further investigated. Just contemplate for one moment the momentous issues of the subject. Look at the tremendous milk trade of this country. It was of the greatest value to the milking interest. Here was an assertion made by a doctor that cows communicated Scarlet Fever, through the medium of milk, to the human subject, and he went further and said that by inoculation they could re-communicate it from the human subject to the cow. He must say that it was such an extraordinary issue to bring before them, that it must be set right or proved to be wrong. It was of such vital importance to the whole community that he rejoiced to think they had opened a discussion, and he particularly thanked Professor Penberthy for coming there and giving them the facts as they remained before

the public up to that time. A charge was made against them of being apathetic in investigating new diseases, and in studying the public health from a sanitary point of view, and he had no hesitation in saying that it was wholly unfounded, because he did know that at the Royal Veterinary College in Camden Town, as well as in the Agricultural Department of the Privy Council, experiments and investigations of an important character were taking place, and in an obscure disease of this kind it took a considerable time to determine upon. For Dr. Klein and others to say what they had was not favourable to scientific study, but he thought that in Dr. Klein's own statement they had a partial if not a whole contradiction to the conclusion at which he arrived. He distinctly stated that the organic symptoms, or the constitutional symptoms of the animals, as at Hendon, were totally contrary to those found in Scarlatina of the human subject. He thought they would all agree that it was almost impossible to have Scarlatina in the human subject without some rise of temperature.

Professor PENBERTHY: Never; it could not be.

Mr. MARTIN: Particularly fever.

The PRESIDENT: And here we have undoubted facts, which have never been disproved, about the animals which were supposed to communicate the disease from the dairy at Hendon to the public in London, that there was no constitutional disturbance of any character whatever. I say that that to a great extent refutes what he tries to impress the public with. It is the clearest possible proof in my opinion that the disease which he says existed in these cows, and was transmitted through milk to the people in London, who had Scarlatina, is evidence of the weakest possible character, and I cannot help thinking that an important statement such as that ought not to have been allowed to go forth to the public on such futile grounds. Even the *post-mortem* examination showed that the disease was of the mildest character. In conclusion the President impressed upon country members to make known every case of a similar character as soon as it came to their knowledge, so that one of the professors of the College might investigate it.

Mr. HOLLINGHAM asked whether there was any information which would lead them to suspect that the patches on the body were irritable.

Professor PENBERTHY, in reply, said they had no evidence of this disease in animals. As he said at the commencement, looking at it from a philosophical point of view—and they could look at it in no other—the security of society was the desideratum of human life. When that security was achieved, social status or public appreciation would follow. The bringing about of it was at their disposal very largely. He was very glad of the suggestions which had been made; they would not kill anybody, but would give them an opportunity of proving that they were not what a certain strong-headed German gentleman would have them thought of. Now that his views had appeared in public print, they were bound to meet them, and they must meet them with matter as definite, not general, as he had brought before them. The information they had had that day, they must dissect, and get the definite points. The issue of the report by Professor Axe certainly had a great effect; it could not help having it. Unfortunately, it was made late; there was no gainsaying that the *Morning Post* took it up warmly, and was bitterly opposed to anything that veterinary surgeons said. At any rate, they could do nothing at Camden Town unless assisted by the public generally, for they must have information. He was thoroughly conversant with the disease; the whole of his life had been spent more or less as one specially interested in rearing well-bred stock, and such a thing as described by Dr. Klein was a common matter to him. Singularly enough, with the issue of Dr. Power's first report, they had a cow at the College which was suffering from a disease apparently identical. Professor Axe saw it, and he said that it

appeared to him to have the identical disease of the cows at Hendon. He (the speaker) drank some of the milk, but he had had no Scarlet Fever (hear, hear). Alluding to Mr. Martin's remarks as to the absorbing powers of milk, he said that meant that milk was a suitable soil for the development of the virus. Wherever they had a contagious disease they must allow that it depended on a living thing.

Mr. LEGGE asked what was the distinguishing symptom between Scarlatina and Cow-pock in the cow.

Professor PENBERTHY said that the first symptom of Cow-pock was on a red base, which was not much raised. Then they had the hard stage, which lasted three days; then the water stage, and sometimes the pustular stage, but the latter did not often come on. In the next three days they found a scaly condition, which was raised up in Cow-pock. Proceeding, he said, there was no doubt they would be able to stamp out disease in animals by a proper distribution of hygiene. As the President had said, it was difficult to imagine a disease depending upon a germ without the production of fever. To take any notice of *post-mortem* examinations in such mild diseases as they had heard of that afternoon, was, to him, of no use.

Mr. MARTIN, in proposing a vote of thanks to Professor Penberthy for his interesting paper, spoke of the interest he had displayed in the subject, and said there was no doubt it would have a useful effect upon them, and excite them to further investigation, in order to protect them from such condemnation as they had received at the hands of Dr. Klein.

The CHAIRMAN seconded the proposition, which was carried with acclamation.

Professor PENBERTHY acknowledged the compliment, and said, that if they furnished him with information of any cases, he should be extremely glad.

Mr. HOLLINGHAM proposed a vote of thanks to the President, and said he did not regret the small attendance so much as the misfortune of those who had stayed away, thereby losing the benefit of one of the most useful discussions he had listened to during the time he had been connected with the Association.

The CHAIRMAN having replied, a most interesting and profitable meeting was brought to a close.

LANCASHIRE VETERINARY MEDICAL ASSOCIATION.

THE usual quarterly meeting of the above Association was held at the Blackfriars Hotel, Manchester, on Wednesday, June 8th, 1887.

Present:—Mr. Thos. Briggs (President), Messrs. Thos. Greaves, S. Lock, T. Hopkins, J. B. Wolstenholme, W. Dacre, W. A. Taylor, A. B. Wren, J. Ingram, A. J. Jones, all of Manchester; Messrs. W. Whittle and A. New, of Worsley; Messrs. Jas. Eltoft and R. H. McRaith, of Lancaster; J. S. Carter, Burnley; A. Munro, Altrincham; A. M. Michaelis, Stockport; R. C. Edwards, Chester; Jos. Abson, Sheffield; H. Ferguson, Warrington; Wm. Noar, Bury; the Secretary, Liverpool; and Dr. Dreschfeld, Professor of Pathology at Victoria University, Manchester.

Apologies for non-attendance were received from Professors Williams, Robertson, McCall, Walley, and Axe, Messrs. William Woods, sen., Wm. Woods, jun., of Wigan; H. Thompson, Aspatria; J. M. Marshall, Knutsford; J. S. Hurndall, London; H. Barnes, Malpas; W. W. Smart, Birkenhead; and C. W. Gillard, A.V.D., 13th Hussars, Manchester.

The minutes of the preceding meeting were then read and confirmed.

The SECRETARY proposed, seconded by Mr. W. A. TAYLOR, that Mr. Henry Sumner, M.R.C.V.S., of Liverpool, be elected a member of the Association.—Carried unanimously.

The SECRETARY also proposed, seconded by Mr. S. LOCK, that Mr. A. J. Jones, M.R.C.V.S., of Manchester, be elected a member of the Association. —Carried unanimously.

Mr. JAS. ELTOFT, of Lancaster, nominated for membership Mr. R. H. McRaith, M.R.C.V.S., of Lancaster.

Dr. DRESCHFELD, Professor of Pathology in the Victoria University, Manchester, gave a most interesting lecture and demonstration on Pathogenic Organisms. He briefly traced the steps which research had made, and the revolution in medical ideas which had resulted. The doctor then described the modes of examination, the various methods of culture, and the tests adopted in proving that they were pathogenic. Many specimens of these microbes were examined by the members present, as were also a large number of microscopic specimens. Amongst the naked-eye and microscopic exhibits may be mentioned the organisms peculiar to Septicæmia, Erysipelas, Pneumonia, Tuberculosis, Typhoid, Scarlatina, Cholera, Leprosy, Actinomycosis, Glanders, and Anthrax.

A very interesting and exceedingly profitable discussion followed, after which

Mr. J. HOPKINS proposed, seconded by Mr. THOS. GREAVES, that a very cordial and hearty vote of thanks be accorded to Dr. Dreschfeld for his kindness in favouring them with such a valuable lecture, which was supported by several other members present, and carried unanimously.

The usual vote of thanks to the President terminated a very successful and enjoyable meeting.

YORKSHIRE VETERINARY MEDICAL SOCIETY.

THE usual summer quarterly meeting took place at the Queen's Hotel, Leeds, on the 29th July, the President, Mr. Geo. W. Carter, F.R.C.V.S., in the chair. There were also present: Messrs. J. W. Anderton, Ripton; J. M. Axe, Doncaster; Geo. Schofield, Pontefract; Lodge, Dewsbury; Scriven, Tadcaster; Deighton, Riccall; Hardie and Pickering, York; Briggs and Hanson, Halifax; F. P. Carter, Bradford; Thos. Fletcher, Sheffield; Toop, Knaresbro'; Bell, Brighouse: Beck, Castleford; Robinson, Barnsley; Chambers, Kirkheaton; Broughton and Greenhalgh, Leeds.

Messrs. Exley, M.R.C.V.S., Leeds, and Powell, a student, were visitors.

Apologies for non-attendance were received from Professors Williams and Axe; Messrs. Dray, Greaves, J. S. Carter, Bale, Danby, Whitehead, B. Smith, and Secker.

The minutes of the previous meeting were read and confirmed.

Mr. Scriven nominated Mr. J. Clarkson, Apperley Bridge; the President nominated Mr. J. Thornton, F.R.C.V.S., Thirsk.

Mr. TOOP moved, "That our representatives in the Council be requested to call the attention of the Council of the Royal College of Veterinary Surgeons to the literary effusions on Veterinary Pathology, edited by the Messrs. Gresswell, of Louth, and published in penny newspapers."

Mr. BROUGHTON seconded.

Mr. GREENHALGH moved, as an amendment, "That no further action be taken in this matter."

Mr. PICKERING seconded, and Mr. FLETCHER supported.

After some discussion,

Mr. TOOP withdrew his proposition.

Mr. A. W. BRIGGS moved, and Mr. TOOP seconded, "That a telegraphic address from this meeting be sent to Sir H. L. Simpson, Mayor of Windsor, congratulating him on his knighthood, and hoping that he may long live to be an ornament to the profession."

Carried with *éclat.*

Mr. DEIGHTON exhibited a large calculus taken from the colon of a small pony that had been subject to frequent attacks of Colic.

Mr. BRIGGS said that a black cart mare, the property of the Halifax Sanitary Contractor, received a puncture from a piece of steel wire in the off fore foot, between the sole and the frog. Six days afterwards, Tetanus supervened, and progressed rapidly for forty-eight hours, until the jaws were almost firmly fixed, Trismus and Opisthotonus being well marked. The patient was cast, and the trunks of the plantar nerves divided (simply division) above the fetlock joint. In twenty-four hours afterwards, the mare's jaws were comparatively mobile. She commenced feeding, and recovery was complete in about twelve days. Experiment proved that union of the divided nerves had taken place. The mare is now in full work—three months after the operation. Mr. Briggs strongly recommended the members to try the operation of neurotomy in cases of Tetanus arising from injuries to the foot.

Messrs. ANDERTON, SCHOFIELD, AXE, TOOP, DEIGHTON, and FLETCHER, joined in a short discussion upon the treatment of Tetanus.

Mr. AXE had seen Tetanus supervening upon a rupture of the dorsal muscles, near the spine.

Mr. BRIGGS related a very interesting case of Thrombosis. On the 29th April a black cab mare, whilst working a fare, became suddenly lame of the near hind leg, and also exhibited symptoms of abdominal pain. The leg was suspended in a manner similar to a horse's leg when affected with acute inflammatory œdema. 30th April.—The leg symptoms had disappeared, but the mare was evidently suffering from progressive Enteritis, and was treated accordingly. 1st May.—The leg symptoms had returned, and the limb was icy cold, and warmth could not be induced by constant friction, etc. The patient died about eleven p.m., and the diagnosis was Thrombosis of the external iliac artery. The *post-mortem* examination revealed complete occlusion of that vessel; also the usual appearances of Enteritis.

The morbid specimen was exhibited by Mr. Briggs, who made a few remarks as to diagnosing these cases.

A cordial vote of thanks was awarded Mr. Briggs for his kindness in relating the two interesting cases.

Mr. FLETCHER re-read a portion of his paper on "Veterinary Ethics," and the portion where he recommends a Board of Arbitration, composed of veterinary surgeons, for the settlement of disputes as to soundness, instead of resorting to costly legal tribunals, was the principal topic of discussion.

Messrs. SCHOFIELD, AXE, TOOP, and other members thought the plan might be made workable; whilst Messrs. LODGE, GREENHALGH, BRIGGS, etc., thought that people would still resort to the law.

Eventually the subject was left in abeyance, pending the opinions of other societies on the scheme.

Mr. BRIGGS moved, and Mr. AXE seconded, a vote of thanks to Mr. Fletcher.

Carried unanimously.

Professor J. Wortley Axe has kindly offered to give a lecture to the members at the October meeting.

The following is Mr. Fletcher's paper:—

VETERINARY ETHICS.

GENTLEMEN,—In compliance with your request, I have prepared a short paper on this subject. I have not done it with a view of laying down a law or rules of my own, but to create a discussion on the subject, and for us, as a body, to lay down some rules for our future guidance.

When I commenced this paper, I was induced to look more particularly for the meaning of the word "ethics," as I had often heard it used for matters of very opposite meaning, and it is a word that has lately come very much into fashion. I find it to mean the doctrine of morality, the science of moral duty, a system of moral principles, etc., etc. Now, gentlemen, I do not think that it was your intention, and I am sure it was not mine, that I should preach you a sermon on morality, but I must say that, as a body of educated men, which we profess to be, we ought in our lives and by our conduct show to those around us, and to the world at large, that we are not only members of an honourable profession, but that we are also honourable members of the same profession, and of society in general. Well, gentlemen, to assist me out of my difficulty, I have called to my assistance an old familiar friend or word, "etiquette," which means form of behaviour or manners, expressly or tacitly required—ceremonial code of polite life—forms of ceremony, etc., etc. —these embrace, I believe, the matter we wish to discuss, and from which we must lay down rules for our guidance as to our form of behaviour in our professional duties, and in our actions towards each other as veterinary surgeons and towards our clients—the public.

I think if I divide my subject into parts, we shall be better able to discuss it. The first part is our duty towards our clients (they are the public, of course); the second part is our duty towards one another as veterinary surgeons and professional men. Our duty towards clients is to give all necessary attention to the case entrusted to us, and to use our best abilities for the benefit of the patient as well as the client. We, gentlemen, are in a different position to the surgeon and physician; with them it is a matter of cure or relieve at any price, but with us it is cure or relieve, but do not forget the "cost" must not exceed the value of the patient. All who have been in practice a few years know the difficulty this £ s. d. job puts in our way; how often we have a very interesting case, one that we thoroughly understand, and know the different phases it may have to pass through before a cure can be effected, but the £ s. d. question stares us in the face, and we cannot go on. I believe it is almost as much on this point that a veterinary surgeon's success depends as upon his abilities to cure. I can tell our young friends that this question is much more troublesome than it used to be. Everything is "go-a-head" now, and you must not keep a lame horse occupying a stall for an indefinite time when a sound one would be earning his master something. This, I believe, is our principal duty towards our clients.

What ought to be the (etiquette) form of behaviour or manners, expressly or tacitly required of us in our actions towards each other? We should meet each other with the outstretched hand of good-fellowship, with freemasonly brotherhood, with openness and frankness, no sly looks and hanging back. But some may say, How can this be done when the man you are meeting or speaking to has (to use a familiar term) run into you—has got one of your cases on his list, and is perhaps running you down in the bargain—may be, has taken some of your contracts at half the price you have been receiving? Under such circumstances there is great difficulty in carrying out the proper professional etiquette; but instead of returning evil for evil, let it arouse you to greater activity, and bring out your latent abilities. Study more, for we have never done learning, especially in these days when science is making such rapid strides, and perhaps by your extra knowledge you may soon be able to take advantage of your adversary. I may, perhaps, be excused for saying many of our young men, when they have obtained that blessed ticket of membership, think they have learnt sufficient—all their troubles are over; but experience will tell them it is not so; they will have to keep in close contact with the science of the day. I am of opinion if there was more open-

ness and frankness we should not have so many professional troubles amongst us.

What is or ought to be our mode of procedure in cases of consultation, or, as it is more commonly called, a "a second opinion"? Second opinions are often very useful, and should, and in fact would, be more frequently adopted if only done in the right manner.

When a second opinion is asked for, and Mr. No. 2, as I will call the gentleman for brevity's sake, has been selected--and this should be left as much as possible with the client, so that there may not be the slightest suspicion of collusion—then a time should be fixed as suitable as possible for all parties, and when they meet Mr. No. 2 should hear the history of the case from Mr. No. 1, with as much additional information as he may require from the client, and then proceed to examine the case, and I think I need hardly say carefully, as his professional reputation is at stake upon the opinion he gives. Having done this, No. 1 and No. 2 should withdraw from all other persons, and then No. 2 give No. 1 his opinion with the reasons for such opinions, and should they not agree there is no reason why any unfriendly feeling should be caused by such opinion, but No. 2, who then has the lead, should tell the client what his opinion is, and, if necessary, upon what grounds he has found it, and if his friend No. 1 has really been blundering over the case there are always ways of covering it so that the client shall be none the wiser. And here I would remark—let your ethics be brought into full play in these cases —to No. 2, Don't let the position you are placed in be used for self-aggrandisement, to the injury of your brother professional; to No. 1 I would strongly advise that he thoroughly carries out the instructions of No. 2, even if it be to his prejudice, but should he find the treatment prescribed by No. 2 acting prejudicially he should at once give notice to his client, and request further advice from No. 2; it will then remain with the client to say what shall be done. Gentlemen, I am sure if this plan of ethics or etiquette was more rigidly carried out there would be less ill-feeling and more consultations.

I cannot let this subject pass without drawing your attention to the way in which these consultations are sometimes carried out, as a contrast to what I have recommended. A consultation is arranged for; Mr. No. 2 appears on the scene half an hour late—of course he has been so busy that it was impossible for him to get earlier; he at once proceeds to examine the animal; if a lame horse, to have him moved or run out, and at once pronounces judgment on the animal and on No. 1 at the same time, by telling the client the seat and the cause of the lameness, what a number of these sort of cases he has seen, and how successful his treatment has always been, and all this, without a word in private to No. 1. Can you wonder at No. 1 saying something naughty about the profession? I have known more than one case where Mr. No. 2 as soon as he could see the client alone has told him, If I had had the case at first I should have done so and so. Now, gentlemen, such like conduct is not ethics, etiquette, or fair-play, and the man that does it wants boycotting, which is as strong a punishment as I can recommend.

If consultations are carried out in the manner described in the former part of my paper—and I am pleased to think and believe it is the most general way—a consultation is a pleasure and a benefit, and leads me to ask, why should we always wait for a client to suggest another opinion? why should we not have that confidence in each other that we should be able to say, "I say, Smith, Brown, Jones, or Robinson, I should be very pleased if you could come and look at a troublesome case I have on hand and give me your opinion"? Why, gentlemen, there is not a man in this room to whom such help would not be a great boon at some time or other, and it is from members of these associations we ought to get such help; and don't you think, if we

could do so, we could at the same time talk over our fees and charges, and make them more uniform in the district or county in which we practise? If this could be done there would be no occasion for "cutting charges," "running down," and bitter incriminations. Why, gentlemen, we are not (as a body) so thick on the ground yet but that we might have this matter in our own hands; we might be, and we ought to be, better paid for many of the services we render to the public and for the medicines we supply. Gentlemen, it is not the public who cut the prices down, or, in strong language, cut our throats; it is ourselves cutting at each other and lowering the profession. I admire and am pleased to see or meet a man who rises in his profession by his abilities; he is an honour to his country and to his profession, whereas the man who makes "low charges" the standpoint of his success is an equal disgrace to both.

The next part of my subject is our mode of procedure in cases of examinations as to soundness or unsoundness. In this matter a great deal of the former part of my paper must be brought to bear. Our ethics must not be forgotten, and then if we have to meet in the county court, or any court, we need not throw shy looks at each other, or get on the opposite side of the court or street to get out of the way of the man who differs with us. There are matters connected with the soundness or unsoundness of animals where there always has been differences of opinion, and always will be. The man is not born yet who can give a positive opinion to some of the questions that arise in cases of soundness or unsoundness. I think it would not be out of place here to say, I think if veterinary surgeons were to make themselves less partisan in some of the court cases, and give their opinion with less bias in the witness-box, we should not hear such bad things said about us by the public.

It has often occurred to me whether we ought not to have a council of veterinary surgeons to whom we might recommend our clients to refer some of these disputed cases and save the trouble, vexation, uncertainty, and expense of the law, to say nothing of the public exposure of the profession by the differences of opinions. If the feeling that I say ought to exist amongst us did exist, the veterinary surgeons on both sides would readily advise their respective clients to allow the case to go before the veterinary council and be decided by their opinion.

The next part of my paper is to consider whether it is against our ethics or etiquette to work a business in connection with our profession. I think it is quite a matter of individual opinion and requirement. I do not see why a man who has entered the profession should have his abilities for other things shut up, and not be at liberty to carry on any kind of business he likes so long as he remembers his professional ethics and etiquette; the public will soon let him know if he neglects his professional duties, or whether his abilities fit him for the business he has undertaken. There is only one business that offers any difficulty in being carried on in connection with the profession, and that is "Horse-dealing," and this, although a difficulty, is not an impossibility. If a man has made up his mind to act honourably in all his works and ways with his fellow-men, he can "horse-deal"; at the same time, perhaps the less done the better, for more reasons than one.

Some say we have no business to work forges in connection with the practice; that it lowers the dignity of the profession. I will leave this, gentlemen, for you to decide. I do not see it in that light. I know we cannot live on dignity, and as it is more honourable and dignified to meet our liabilities, I think we are justified in adding a trade to our profession if necessary.

There are different opinions as to the means a veterinary surgeon should

adopt to make or extend his practice. As times go now, it will not do for a young man to put up his name or sign and sit behind it until the public find him out by accident, or from an accident; he must advertise by the distribution of cards and circulars, and, of course, these will go to clients of a brother professional, but this is quite legitimate so long as the circular is confined to the address and qualifications, "without special" attention to the moderate charges; the same will apply to newspaper advertising.

I must now thank you very much for the patient hearing you have given me.

LIVERPOOL VETERINARY MEDICAL ASSOCIATION.

THE usual quarterly meeting of the above Association was held in the Medical Institute, Hope Street, on Friday, August 12th; the President, R. C. Edwards, Esq., in the chair.

There were present: Messrs. Greaves, Morgan, Faulkner, A. Leather, S. Locke, T. J. Davies, W. A. Taylor, T. Hopken, W. Woods, and the Secretary.

After the transaction of the preliminary business, Mr. R. S. Mitchell, Old Swan, was unanimously elected a member of the Association.

Mr. GREAVES gave notice that, in consequence of the continued poor attendances of members, he would at the next meeting move that the affairs of the Association be considered.

The PRESIDENT then called upon Mr. Greaves to read his paper on

OPEN JOINTS AND QUITTORS FROM A SCIENTIFIC POINT ON VIEW.

Mr. GREAVES then said—

I have chosen these subjects because we are all familiar with them; each one of us has had to treat cases, may have our own method of treatment, and by an interchange of opinion we are enabled to compare results and gain knowledge.

Those of us who have extensive practice know that many of these cases prove very tedious and intractable, requiring all the attention and knowledge acquired by experience to cope with them successfully.

Open Joint

is nearly always a result of accident; if the injury is simply a clean incision through the skin and capsular ligament, it may, if proper care and attention be paid to it, readily heal, and be attended with little or no danger; but if the incision be accompanied by bruising, or crushing of the capsular ligament and rim of the articular cartilage, or caused by a violently-twisted joint, causing intense inflammation, increased secretion of synovia, distention and bursting of the capsular ligament, then it will often be found a very formidable case to treat.

The immediate consequence of open joint is a tenderness produced in the delicate synovial membrane; owing to deficiency of synovia it is subjected to a squeezing action between hard surfaces, is crushed, and soon becomes inflamed.

I grant you we can have a joint inflamed, and all the train of evil consequences of inflammation, without the joint having been open, as, for instance, in the case of Navicular Disease and Hock Joint.

Physiologists inform us that a greater danger is to be apprehended from the admission of air into the joint, and still more recently the theory or doctrine is advanced that the mischief resulting from the admission of pure air is not to be attributed to the air simply, but to the invasion of numerous microbes into the joint along with the air, that it is to the presence of these microbes that we must ascribe all the mischief that takes place. Such being the case, it will be clear and self-evident to each of you that our great con-

cern must be the careful exclusion of the air, and with it the complete exclusion of these microbes.

At a meeting of the North of England Veterinary Medical Association, held at Newcastle-upon-Tyne a short time ago, Professor Williams introduced this subject of open joints. His remarks were characterised by his usual practical clearness; he gave us a very interesting and useful explanation how he sterilises the parts externally, and also, in some cases, internally, that is, by injecting a weak solution into the interior of the synovial cavity. To sterilise microbes externally, he saturates the wound, and the skin all about the wound, with a weak solution of corrosive sublimate. I may say here that I have never injected anything into joints—have been frightened to do so. He employs this, not as a styptic, not as a deodoriser, not as a disinfectant, nor yet as an antiseptic, but purely as a steriliser—as a destroyer of microbes.

Science has clearly and most satisfactorily demonstrated that microbes play a more important part in the healing of wounds than was ever dreamt of formerly. The expressions of miasmata, virus, effluvia, etc., which were in use twenty years ago to distinguish that unknown agency which constitutes contagion, are now proved to be referable to microbes. The doctrine of micro-organisms is a high and worthy object of study—it may be regarded as the noblest achievement of modern surgery. The first and most brilliant application of the theory of microbes to human therapeutics has been made in wounds. The admirable results obtained by Lister's method are the strongest confirmation of the truth of the theory of microbes. Since its introduction into medical practice mortality amongst the wounded and amongst surgical cases has considerably diminished. This is the essential point to which we ought never to close our eyes. Operations formerly considered impossible have been undertaken and successfully carried out; for a long while we were almost completely ignorant of the condition of existence of microbes. Disease was thought referable to miasmata, virus, effluvia, etc.—terms becoming now obsolete. It is now generally admitted that a large majority of epidemics, fevers, and other contagious diseases which affect man and animals, are caused by the introduction of certain kinds of microbes into the organism, and not to injurious gases.

It is hard to realise how fast the world is moving on; day turns into night as of old, but the sun shines each morning on an altered world, now and then a flash reveals all this. The young believe they know much more and better than their grandfathers did. We are all trying to attain to a higher knowledge, trying to arrive at faultless precision. At times we stand still to contemplate our position, we try to exercise a sound instinct. We sometimes ask ourselves "Is this all gain?" is this beautiful, captivating theory, which holds us spellbound, as it were, sound, and based on truth? Let us ask ourselves,

What are Microbes?

They are invisible micro-organisms existing in immense numbers. They seem to be part and parcel of the air, though not discernible by the naked eye. They are found also occupying fluids and solids, in the crumbling stone and in the rusty iron. The term microbe is a generic term, and comprises different kinds, such as bacteria, bacillus, micrococcus, and many other individual germs; they are more numerous in some localities than in others; are stronger and more vigorous in one locality than in others; in some situations they would seem more attenuated and feeble; in some localities, such as privies, cesspools, etc., microbes cannot co-exist with the gases given off from them, but it is within the knowledge of almost every veterinary surgeon, if you castrate a colt, or perform any surgical operation in the vicinity of a dissecting room or slaughterhouse, or any such-like place, it is almost certain to take bad ways. The parts take on unhealthy action, unless very great care is

taken to sterilise everything that comes near the wound; it would be well if we bear this in mind, and carefully sterilise our instruments, and everything that has to touch wounds.

The study of this subject is of vital importance in aiding us in arriving at some practical solution of what at present remains a deep and profound mystery, viz., that which produces, regulates, and controls vital phenomena; science proves this to be no conjectural hypothesis. The air teems with these micro-organisms. They are not dead, lifeless, inorganic atoms, which never created life or imparted life. We are quite satisfied life cannot emanate from inorganic stuff; life surely never comes into existence, under any circumstances whatever, unless from pre-existing life. There is something intricate and grand in all life phenomena, it has baffled the wisdom and conception of by-gone ages, and still is shrouded in the profoundest mystery. Even in these lowly-organised germs there are life phenomena superior and above mere physical or chemical forces. The scientific spirit of the age, or what some call modern advanced thought, can arrive at no other conclusion than that all life must come from pre-existing life.

So much for microbes. Professor Williams also advises the use of shellac varnish, with the object of plastering up the orifice, excluding the air and also microbes. Keep the limb at rest as much as possible. I apply corrosive sublimate powder to the wound on a small pledget of wet cotton-wool passed into the incision, and left in it. Some prescribe iodoform, but I have not witnessed any good effects from its use. I apply blister ointment to the surrounding skin; it will swell the skin and plug up the opening. I have used oil of cloves with various success. This, with the rest shoe nicely adapted, the heel neither too high nor yet too low; and when much lameness is present I am a strong advocate for slings. How often do we see a horse to all appearance doing nicely, the pain getting less, the discharge of synovia becoming less and less, when the horse is allowed his head and he lays down; in the act of getting up he gives the leg a slight twist, and in a moment is undone all the improvement which had taken two or three weeks' care to induce. If open joint continues, the articular cartilage becomes worn, cracks, caries of bone under it follows, and the case is hopeless.

"*Quittor.*"

This is a sinus in the coronary substance of the foot, from which issues a discharge. It is often caused by a tread from the other foot, or an injury from some other cause. The lateral cartilage is more or less injured, and the discharge proceeds from diseased surface of the cartilage and tissues adjoining. When the injury is severe it is followed by a sloughing of the skin and coronary substance that has been crushed. This is generally accompanied with tumefaction of the coronet; occasionally the capsular ligament is involved in the injury, and may slough, leaving open joint. This is always attended with much pain; the horse will often hold his foot up and nurse it for days and days. I think the best method of treatment is, at first, fomentation, poultice, physic, and rest shoe; if the pain is very great, I may bleed, and give aconite. Let him have plenty of droppings under the lame foot to preclude all jarring of the lame foot on the bare stones—microbes do not emanate from the droppings of horses. Sometimes the case is protracted, the discharge continues, and will break out in another and yet another place in the coronet. I advise daily injection of a saturated solution of common sulphate of zinc, and blister ointment to the coronet, repeated in very protracted cases; and where the coronet is much tumefied, I pass into the sinus a pointed red-hot iron, say one inch deep in the sinus, and then pass in corrosive sublimate powder, a pledget of wet cotton-wool passed into the sinus, and bandage; leave it in three days. If the horse is very lame I am a strong advocate for the use of

slings. I also have the upper part of the hoof rasped quite thin to enable it to expand, and thus remove and relieve the tightness, or tension upon the periosteum and other tissues immediately below the coronet. The sterilising method of treatment should also be observed in these cases as carefully as in open joints. I must, in conclusion, apologise for not having this paper in a more perfect form; but, in truth, I have had only little time at my command. I hold that the mind of a veterinary surgeon is like a merchant's ledger: it requires to be continually posted up to the latest date; even the last telegram may have upset some venerable theory that has been received as infallible for ages.

The paper was well received, and a good discussion ensued.

Mr. DAVIES kindly promised to read a paper at the next meeting.

The usual votes of thanks concluded the meeting.

HY. SUMNER, *Hon. Sec.*

SCOTTISH METROPOLITAN VETERINARY MEDICAL SOCIETY.

THE quarterly meeting of the Society was held on the 24th August, 1887, in the London Hotel, Edinburgh. There were present Professors Walley, Williams, Baird, and Lewis; Messrs. Cunningham, Hutton, Spreull, Reid, Fingzies, Cassells, Fairbairn, Barclay, Storrie, Aitken, senr. and junr., Edinburgh; Aitken, junr., Dalkeith; Black, Moir, Reid, Leith; McArthur, Connochie, Ayton; Young, Boyd, Stewart, and Young, Leith.

Professor WALLEY apologised for the absence of the Secretary, who was unavoidably out of town, and who had asked him to undertake the duties for this occasion. Professor Walley had also to state that the President was very ill, and unable to attend; consequently one of the vice-presidents would require to take the chair, which was accordingly done by Professor Lewis.

The minutes of last meeting were then read and approved of.

Professor Walley nominated six gentlemen for election as members at next meeting, and Mr. Storrie nominated Mr. Bannatyne for election at next meeting.

Letters of apology for non-attendance were read from Messrs. Thompson, Aspatria, and Cameron, Berwick.

It was unanimously agreed to allow the letter from the Royal Counties Veterinary Medical Association to lie on the table.

Mr. CUNNINGHAM introduced his motion in reference to the retirement of Professor McFadyean. He submitted it on the broad principle that, if a member of an association makes insulting remarks, is put down by the chair, then goes to a paper outside and uses insolent language, and makes an attack on another member, he should, in his opinion, be asked to retire, as being unfit to remain as a member of the Association. He recapitulated all the circumstances of the annual meeting, read Professor McFadyean's letter in the *North British Agriculturist*, drew attention to Professor McFadyean's statement at last meeting, "that what he (Professor McFadyean) had written was the truth, and he was prepared to stand by it," and to his further statement that "it was a fact that Professor Walley had been unjustly attacked by Mr. Rutherford." Whether this were so or not he (Mr. Cunningham) could honestly say that he had never made any attack upon Professor Walley in this or any other meeting. He explained the meaning of the word "farce," read his resolution, and, in asking the members to vote for that resolution, he reminded them that they had come to the parting of two ways.

Mr. BORTHWICK seconded the motion.

Professor WILLIAMS supported, and in doing so said that he considered the letter a very offensive one, and that, although strong remarks were made

at the annual meeting, both by Professor McFadyean and Mr. Rutherford, he did not think the former was warranted in writing such a letter.

Professor WALLEY, in moving a direct negative to the resolution, recapitulated the remarks he had made before in reference to the origin of this matter, and especially drew attention to the direct, unwarrantable and unprofessional attack made on himself by Mr. Rutherford. He (Professor Walley) had nothing to do with any language which might be used outside the Association, but he might direct attention to the fact that much more violent language had been used by other members of the profession in other places; and as Professor McFadyean had acted in his defence, he looked on this as a personal matter. Mr. Cunningham had stated that he "had never made any attack on Professor Walley in this or any other meeting," but he (Professor Walley) had to remind him that, if he had not attacked him in the meeting, he had made a covert attack on him in a newspaper. He thought that if there was any man in the Society who was justified in resigning on account of discourtesies and insults which had been offered him, even by officials, it was himself. He further said he would not waste the time of the meeting by prolonging his remarks, but would at once put his amendment so that the miserable business might be terminated without delay.

Professor BAIRD seconded Professor Walley's amendment.

The motion was then put; thirteen voted for and ten against.

The CHAIRMAN declared the motion carried.

Mr. CUNNINGHAM then rose to propose his second motion, with reference to the representative of the *North British Agriculturist*, but withdrew it by advice of Professor Williams.

Professor WALLEY then made the following remarks on

"THE CLINICAL USES OF IODINE."

He said:—

Mr. PRESIDENT AND GENTLEMEN,—Allow me in the first place to correct a mistake in the notice summoning this meeting. It is stated on the agenda that "Professor Walley will read a paper on the Uses of Iodine." This I did not offer to do, as I had no time to prepare one, but I shall have much pleasure in directing your attention to some uses of iodine which may be of value to you in your daily practice.

I have on various occasions, and in various places, directed the attention of the profession to the value of iodine in the treatment of bursal distensions. My first case of this kind occurred during my first year of practice in North Wales, and was a case in which the patella bursa of a colt was so enormously enlarged as to extend a considerable distance down the thigh. The colt had been treated for nearly a year by an empiric, and as it was a matter of "kill or cure," the owner left the case in my hands. The treatment consisted of free evacuation of the synovia, the introduction of iodine into the sac, and its application with soap liniment to the skin. I never saw the colt again, but was informed by the owner that the treatment was entirely successful.

My next trial of the *intra-bursal injection* of iodine was in a case of Thoroughpin which had resisted the curative influence of firing, blistering, setoning, aspiration, and compress; it was injected after the evacuation of the synovia, was perfectly successful, and the horse has worked *sound* for the past three years.

In the summer of last year I was shown by Mr. Barling, of Newnham, a bad case of Patella-bursal disease in a colt, upon whom I had assisted Mr. Barling, of Ross, to operate the previous year for Fistula of the Withers; the colt was useless, was, in fact, on the way to his last home—the kennels—when I saw him; firing, blistering, etc., had been practised without relief.

Intra-bursal injection of iodine was carried out—the first operation by my-

self, and subsequently, as often as circumstances demanded, by Mr. Barling —with success.

Some months ago an Irish setter-dog was placed under my care, suffering from rheumatic distension of the anterior fetlock, bursæ of each foreleg, with considerable interstitial thickening of the surrounding parts. After the application of various remedies without relief, I ordered frequent subcutaneous injections of iodine; the result was in the highest degree satisfactory.

Two days ago, in speaking of the subject with Mr. Malcolm, of Birmingham, he informed me that, remembering my remarks on the value of iodine injections in bursal diseases made at a meeting of the Midland Counties Association at Walsall, he was led to try its effects in an intractable case of open navicular bursa. A speedy cure resulted.

Some time ago I noticed an article in the VETERINARY JOURNAL by Mr. Cunningham in reference to the treatment of pre-scapular tumours in the horse. I would advise Mr. Cunningham to try irrigations of iodine in any similar case in the future. It will probably be remembered by some of the members that I some time ago directed attention to the value of deep puncture in such cases. I subsequently determined upon employing iodine irrigation, and have treated a number of cases since by this method, and in almost every instance the effects have been all I could wish.

The operation induces, usually, one of two things, viz., central suppuration and absorption after the evacuation of the pus; or, absorption without suppuration; but in one case, lately, the results were somewhat unexpected, and, at the outset, alarming.

The tumour was a very large one and very hard. Blistering and irrigation in the ordinary manner had no effect on it, and I then used a stronger preparation of iodine injected with my aspirator syringe and needle; but in performing the operation I had, on account of the excessive hardness of the tumour, to pulp a large area of it internally before I could get the injection to flow. The irrigation was followed by manifestations of great pain (a thing not usually seen), and in the course of a few days, acute phlegmonous cellulitis, extending down the leg and all over the pre-pectoral and pre-scapular region, followed; it was succeeded by sphacelus of the skin over a large area, and this again by sloughing of the whole of the substance of the tumour, leaving the surrounding muscles exposed and producing a terrific chasm. Healthy granulation went on, and the wound healed with gratifying rapidity.

The healing process was accompanied by absorption of the new tissue in the surrounding structures, and with the exception of a little depression and a moderate sized cicatrix, the part assumed its original condition, without any interference with the action of the shoulder.

I have said that the great sloughing in this case was unusual, and I could account for it only on the supposition that during the pulping process I had damaged or destroyed the artery of supply; probably, also, the fact that the horse had but recently recovered from a severe attack of Purpura Hæmorrhagica had some influence in the production of the sloughing.

I have for some time used iodine, either alone or with phenol, with varying success in the treatment of sinuses and fistulæ, but in a very bad case of multiple rectal fistulæ in a dog, which had resisted various methods of treatment, I injected iodine deeply into the walls of the rectum. The injection was inadvertently used much stronger than I had directed, and it was followed by excessive inflammation and sloughing, but after the healing of the wound, the disease was cured in the part operated upon, and the parts resumed their original size without in any way interfering with the action of the sphincter ani. When practical, I would advise that in treating fistulæ or sinuses, the injection should be passed into the surrounding structures rather than into the cavity itself.

The value of iodine in the treatment of Actinomycosis, Ringworm, and other specific forms of Mucositis and Dermatitis, as also of Pruritis, I have referred to previously in other articles. To its value as an injection in Blenorrhœa, Gonorrhœa, and Vaginal Catarrh I have also alluded elsewhere. In the form of inhalation it is invaluable in the treatment of Nasal Gleet and Chronic Bronchial Catarrh, and in one case it had a very powerful curative effect on the ulcers, etc., of Glanders; the discharge diminishing very materially, and the ulcers cicatrizing rapidly. I consider it far superior to iodoform, to the alleged value of which in such cases I cannot, from my experience, subscribe.

Before sitting down I will, with your permission, Mr. Chairman, briefly refer to the use of cocaine in the operation of plantar neurectomy. Having, recently, to unnerve a mare in both fore legs, I determined upon trying local anæsthetization with cocaine in lieu of general anæsthetization with chloroform. Immediately before the mare was cast, I injected, subcutaneously, a few drops of a 15 per cent. solution of cocaine hydrochlorate over the nerves at the seat of operation. The mare evinced no pain on cutting through the skin, and the paralysis of the nerves was so complete that no sensation was evidenced on compression with the forceps, or on puncturing with a pin, and while the usual reflex movements took place when each nerve was divided, there was no evidence of pain until I divided the last nerve, and this was accounted for by the fact that the anæsthetic effect of the cocaine had passed off. The wounds healed rapidly and satisfactorily.

In the short discussion which followed,

Mr. SPREULL stated that he had used with success injection of iodine, 1-16, into bursæ after opening them.

A vote of thanks to the Chairman and to Professor Walley concluded the business of the meeting. ARCH. BAIRD, *Hon. Sec.*

Army Veterinary Department.

Gazette, July 8th.

MIDDLESEX YEOMANRY CAVALRY—DUKE OF CAMBRIDGE HUSSARS.—Veterinary Surgeon John Edward Jarvis to be Active Veterinary Surgeon.

The Commander-in-Chief in India, in despatches relative to the field operations in Burmah since the capture of Mandalay, when enumerating the special services of corps and officers, says:—"The few officers of the Veterinary Department, including Veterinary Surgeon F. G. Shaw, who could be spared for service in Burmah, have also done good and useful work."

Veterinary Surgeon (First-Class) Rayment has received the thanks of the Indian Government for his services on remount duty in Persia. The services of First-Class Veterinary Surgeon Glover have been highly praised in the reports submitted to the Government in connection with horse-breeding operations. Veterinary Surgeon Pease has passed the higher standard in Hindustani and the lower standard in Persian, and G. H. Evans the higher standard in Hindustani.

The following veterinary surgeons have embarked for a tour of service in India:—Cox, Walker (W. R.), Dundon, Taylor. The following are home on relief:—Evans (J. W.), Pringle, Mills.

The Department has subscribed to the Jubilee Imperial Institute the sum of £43 6s. 2d.

Obituary.

THE Army Veterinary Department has to lament the loss of one of its best officers by the death of First-class Veterinary Surgeon S. R. Sartin, M.R.C.V.S., which occurred in London on September 1st, at the early age of forty-two years. Mr. Sartin was home on sick leave from India, suffering from valvular disease of the heart, and his death was rather unexpected. He had been in the army eighteen years, and bore an excellent reputation, not only for professional ability, but for moral and social qualities. He served in the Egyptian Campaign of 1882, for which he wore the medal and bronze star. A young widow is left to mourn his demise. Our deceased colleague's brother, also an officer in the Veterinary Department, died while on passage home from South Africa, after serving in the Zulu War.

The Army Veterinary Department has also to deplore the death of one of its oldest officers. Veterinary Surgeon, First-Class, Edward Simpson Grey, M.R.C.V.S., on the retired list, died on September 19th, in Edinburgh. He served the Eastern campaign of 1854-55, with the 8th Hussars, including the battles of Alma, Balaclava, Inkerman, and Tchernaya, affairs of Bulganak and McKenzie's Farm, siege and fall of Sebastopol, for which he had the Crimean medal with four clasps and the Turkish medal. He also served in Rajpootana and Central India during the Indian Mutiny, and was present at the capture of Kotah, re-occupation of Chundaree, battle of Kotah-ke-Serai, capture of Gwalior, actions of Koodye and Boordah, siege and capture of Powree, battle of Saidwaho, and action of Koonrye, for which he received the medal and clasp. He graduated in 1839.

The death is reported of F. W. Moss, M.R.C.V.S., of South Lambeth, who graduated in 1844; and also of J. R. Moir, M.R.C.V.S., of Armagh, who only graduated in July, 1886.

Notes and News.

THE BUFFALO-GNAT.—We are informed that Dr. Riley, entomologist to the American Department of Agriculture, will devote a large portion of his forthcoming report to the Southern buffalo-gnat, which does a great deal of damage in Louisiana, Mississippi, Arkansas, Tennesse, Missouri, Kentucky, Illinois, Indiana, and Eastern Kansas. These gnats usually appear after the first spell of warm weather in the spring, their invasion lasting from a few days to five or six weeks. They attack all domestic animals, including poultry, and all, when bitten by many of the insects, show symptoms similar to those of colic, and frequently die. The death-rate of mules, which are extensively used in the South, is higher than that of any other animal. Dr. King, after making numerous *post-mortem* examinations, has come to the conclusion that the bite has an effect similar to that of the rattlesnake. When the gnats appear animals are kept in darkened places if possible, or fires are made of substances which produce a great deal of smoke. Various remedies, external and internal, are used for animals attacked.

THE MICROBE OF WOLF-RABIES.—In a preliminary note in the *Vratch*, No. 21, 1887, p. 415, Drs. Julius Motte and N. Protopopoff, of Professor S. D. Kostiürin's laboratory, in Kharkov, state that while studying Wolf-rabies they have met with a micro-organism which seems to be closely connected with the rabic virus in wolves. The following is an outline of the experiments. A young wolf was inoculated by hypodermic injection of an emulsion of the brain of a dog which had died from spontaneous Rabies of

the furious type. Twelve days and four hours later the wolf developed symptoms of paralytic Rabies, which ended fatally in about forty hours. Half-an-hour after the animal's death, an emulsion of the wolf's brain was introduced beneath the dura mater of a rabbit by trephining. The rabbit died in three days; an emulsion of its brain was inoculated in a second rabbit, from that to a third, and so on. A fifth rabbit, and a sixth inoculated from the fifth, died about twelve hours after the operation, with all the symptoms of paralytic Rabies. On the *post-mortem* examination of the sixth rabbit, a considerable quantity of opaque fluid was found between the dura and the pia, and in the subarachnoid spaces. This fluid contained, besides a few leucocytes, an enormous number of extremely minute, short, and very motile bacilli, of a very special kind; in fact, the fluid represented a natural "pure culture" of the micro-organism. An inoculation with brain and spinal cord from that rabbit invariably produced paralytic Rabies in other rabbits, death always ensuing in about twelve hours. On *post-mortem* examination, the same microbes were found in all cases. The animals' blood also contained similar bacilli, but in far smaller numbers. A rabbit inoculated by trephining with the blood died in twenty-nine hours. Having prepared a pure culture in meat-broth, Drs. Motte and Protopopoff inoculated it either by trephining or hypodermic injection. In the former case, all the animals (four rabbits) died from paralytic Rabies in twelve hours; in the latter, in from two to six days. The same micro-organisms were detected in a young rabbit which had been inoculated by trephining with an emulsion of the brain of another wolf, which had died of spontaneous Rabies. The authors promise to publish at an early date the results of their inquiry into the morphological and biological features of the microbe which they have discovered.

Veterinary Surgeons in the Russian Army.—The Veterinary Department of the Russian Army, which is controlled by the Medical Department, contains 232 veterinary surgeons.

A Good Example.—According to the *Vratch*, a Russian medical journal, a wealthy sheep-breeder of the Tavritchesky Government has given the Odessa Bacteriological Station 300 sheep for some experiments which it is proposed to carry out at that establishment during this autumn, in order to further test the efficacy of Pasteur's method of inoculation against Anthrax.

An Old Charger.—A New York daily says that Colonel W. O. Bolt, who commanded the 83rd Regiment Pennsylvania Volunteers in the war of the rebellion, recently buried the horse which he rode through several campaigns. The old war horse was wrapped in American flags and followed to the grave with music and an immense procession. The horse was thirty-seven years old. At the grave a Methodist clergyman made an address, and the usual honours of war were given.

Antagonism between Bacteria.—At the thirty-third annual meeting of the Schweizerischer Aerztlicher Verein, held at Basle, Dr. C. Garré, Lecturer in the Basle University, and a leading Swiss bacteriologist, made a highly interesting communication on the antagonism existing between certain species of bacteria. His paper was based on numerous experiments which he had made, of which the following is a rough summary. He took meat peptone gelatine, and planted on its surface a culture of a certain species of microbe. When this had attained its full development, he picked out the colonies by means of a sterilised platinum lever, and then sowed micro-organisms of some other species over the surface of the remaining portion of the jelly. The retardation in the growth of the latter species, when compared with its rate of growth in a control-tube or on a control-plate, inocu-

lated at the same time as the other, indicated the degree of antagonism existing between the two species. When experimenting with bacteria which liquefy peptonised gelatine, Dr. Garré sowed the species selected in a test-tube containing meat broth; when the culture had become luxuriant he passed the contents of the tube through a clay filter in order to obtain a sterile medium. Having then solidified the latter by means of alkaline jelly, he planted a second species of microbes. Dr. Garré chiefly studied the relations existing between Fluegge's *bacillus fluorescens putidus* (a non-pathogenic bacterium growing in putrescent fluids, in the water of wells and aqueducts, etc.) on the one hand, and a number of pathogenic and non-pathogenic microbes on the other. Experimenting in the manner mentioned above, he found that there was a most marked antagonism between Fluegge's microbe and the *staphylococcus pyogenes aureus*, as well as the *bacillus typhosus* and Friedländer's *bacillus pneumoniæ*. The three pathogenic micro-organisms did not grow at all when sown in a jelly which had served for three or four days as a nutrient medium for the fluorescent bacillus. The cholera bacillus and the *bacillus mycoides* continued to grow, though far more slowly than in an ordinary medium, while the *bacillus anthracis* and Finkler-Prior's rod increased and multiplied as luxuriantly as on a control-plate. Dr. Garré therefore concludes that "inoculation of the jelly with the fluorescent bacillus confers immunity on the medium as regards the pus staphylococcus, the typhoid and the pneumonia-bacillus." The antagonism is mutual only in the case of Eberth's bacillus; the fluorescent bacillus continuing to flourish in a medium previously infected by the staphylococcus or Friedländer's microbe. The explanation of the antagonism lies in the fact that microbes secrete some specific highly diffusible substances which prove poisonous to certain species of bacteria, while having no effect on others. That the antagonism not only consists merely in the crowding-out or starving-out of one species by another seems to be proved by the following experiments:—A jelly-plate is taken, and cultures of the *bacillus fluorescens* and *staphylococcus pyogenes* are inoculated alternately, in parallel rows, the distance between them varying from 3 to 15 millimètres. When the antagonistic inoculations are separated only by a short distance (3 millimètres, or thereabouts), the staphylococcus does not grow at all; but the wider the distance is, the more abundant is its growth, while the last staphylococcus culture, which has a row of its antagonist culture only on one side of it, is found to grow in an outward direction almost without restraint. Dr. Garré points out also two other forms of inter-bacterial relations. One of these is "symbiosis," or a friendly dwelling together of certain kinds of microbes; the other is "metabiosis," a term by which he designates a relationship in which one species of microbe prepares the nutrient medium for a different species, the preparation consisting either in destroying an injurious substance in the medium, or supplying the latter with some decomposition products which may serve as nutriment for the microbes that follow. Thus, the aërobes, when growing in a fluid, prepare it for anaërobes by absorbing oxygen present in the medium, as well as by preventing any further entry of that gas, by forming a superficial film over the fluid. Again, *saccharomyces mycoderma* decomposes the fruit acids in wine, and thus prepares a favourable soil for the acetic fungi, etc.

CRUELTY TO A COW.—Recently, at Stourbridge Police-Court, Jos. Cuttler, farmer, was charged with sending a cow to Hagley Stock Sale in an overstocked condition. Mr. S. Mutlow, Inspector R.S.P.C.A., gave evidence to the effect that the cow's udder was distended with milk, and in a hot and painful condition. Mr. James Blakeway, veterinary surgeon, gave evidence as to the great pain caused by overstocking cows, and said that many cases of diseased udders were caused in this way. Defendant was ordered to pay

costs amounting to 19s. 6d. The magistrates said this was the first case of the kind brought before them, and in future they should impose a fine.

SWINE FEVER AND HOG-CHOLERA.—At a recent meeting in the United States, Dr. Salmon showed that in the study of Hog-cholera, so called, investigators had been misled by the fact that there have been two distinct diseases known under that name, and the hogs examined sometimes had one, sometimes the other, and sometimes both at once. The true Hog-cholera is caused by a bacterium—*i.e.*, a staff-shaped microbe—and in a general way may be said to attack the bowels chiefly. The other disease Dr. Salmon calls Swine-plague, and attacks chiefly the lungs. The germ is a micrococcus or oval microbe. Both of these germs have been cultivated, and the distinction in their effects noted in various ways. That two contagious diseases should exist at the same time in the same animal is somewhat remarkable. The practical point of Dr. Salmon's paper is that lime will kill the Hog-cholera germ. This is very important, since this germ multiplies in garbage, in stagnant water, and even in good drinking-water and ordinary tilled soils. Lime applied to land at the rate of fifty bushels per acre—an amount often used for agricultural purposes—is found to destroy all the germs to the depth of six inches. The same proportions of lime will destroy the contagion in old manure heaps, which is a chosen home of this infection.

THE CRUEL PLANT.—Attention has lately been called to a plant which was brought from Buenos Ayres to New Zealand a few years ago, and which is known to botanists as *physianthus auricomus*. It is a beautiful climbing plant, and it has the peculiar property of catching butterflies and other insects, on which account it was named the Cruel Plant. It has been thus described:—"The anthers are so placed that their spreading cells form a series of notches in a ring around the pistil. The insect, in putting its proboscis down for the honey, must press it into one of these notches, and, in attempting to withdraw it, the end is sure to get caught in a notch, bootjack fashion, as it were, and the more the insect pulls, the more its trunk is drawn towards the point of the notch. Thus caught, the insects slowly starve to death. So effectually does it thus catch butterflies, that it has been suggested that lines of it planted around cabbage fields might be used to lessen the numbers of the white butterfly, the caterpillar of which (the "cabbage worm") is so destructive to the cabbage crop. That insects are certainly caught by it in great numbers is evident. On a single plant the past season, covering a space of thirty square feet, ninety butterflies, besides many other insects, were trapped. The insect-catching plant has never been claimed by even the most pronounced Darwinian to eat the insects, although in my opinion it has just as much claim to be called insectivorous as the Carolina fly-trap, the pitcher-plant, or any other plant said to feed on insects." It is to be tried as a means of killing the codlin moth and other insects injurious to trees and plants generally in Australia.

Correspondence.

CRUELTY TO ANIMALS.

SIR,—When a man has contributed in every way possible to a cause the major part of his lifetime, it can scarce be said, with any degree of fairness, that he is prejudiced against it. It is "hard lines," especially when such calumnies are promulgated by those whose main interest in the matter is pecuniary, but *Mens sibi conscia recti* consoles us, aided by the reflection that the best of us are liable to misrepresentation.

The nature of our occupation should lead us to befriend the suffering brute, and the advocacy of cruelty, even in a minor degree, operates to a man's prejudice; but these should not lead us to perpetration of injustice by giving support, by evidence or otherwise, to cases that are not true. That the S.P.C.A. is worthy of individual and collective professional support is a matter that all must concede; that this support must be extended so far as making our evidence elastic, and by being untrue to our convictions, I venture to think is carrying sentiment—much of it mock—too far, and is a doctrine to which I, for one, shall not subscribe.

My mode of argument is by illustration. Many cases that have been stopped by the inspector have been brought to me for examination. I must say, that most of them have been unfit for work, and the owners of these have been plainly told so, and I have refused to have anything to do with them; on the other hand, others are very trivial, some even paltry, and where, unless the evidence was very elastic, no conviction could, or ought to be obtained. My idea is, that in these last it is the duty of a professional man to appear, whether odium is thrown on him or not, and I am singular, or perhaps foolish enough to follow this out.

If it be *infra dig.* to endeavour to avert an injustice, it cannot tend to elevate our status by playing the purveyor or jackal for the inspector; perhaps the pecuniary advantage attendant on such a course is a solatium. At this point there are two questions that occur to me that I have never heard answered, and yet they are matter of common rumour. Does the payment of the professional fee depend on a conviction? It is said that it is a case of "no conviction, no pay." Does the certificate of such as are employed by the society, and on whose evidence they *can depend*, exonerate a man working a doubtful animal, whether the same be fit or not? I have heard the remark, "Oh, Mr. ——'s certificate will make you right, he's their man." If this be the case—mark, I am not saying it is; I ask the question—if true, it is a gross insult on the part of the society to the profession at large.

I have spoken of "elastic evidence," I am not intending to say that there is deliberate false statements, but even with the latitude allowed skilled witnesses, the evidence can scarce be denied as being in some instances "over" the truth. The unanimity with which they "go" for a conviction is refreshing. On this point a case in the next town gives an illustration.

A man was summoned for a horse with a sore back. The inspector, when he detained it, took it to the police station, and it was seen by a superior official. It must be noted that the animal had Stringhalt. This peculiarity in action led the policeman to imagine that it was incapable, and he led the owner to suppose that he would get it destroyed. Its value as a work-horse being considerable, the animal was sent to me for examination. "Unfit from sore back; but Stringhalt not interfering with it for slow work," was the certificate.

When before the bench, the sore back was admitted, and at the instigation of the police official, the case was adjourned to allow of veterinary evidence for the prosecution. When re-heard this individual stated that the back was *very, very sore*, which had been admitted, and that the horse *was lame and*

unfit for work. Asked the nature of the lameness: "It was Stringhalt." Further asked if Stringhalt horses were not workable: "*They were, except this case.*" The animus was too plain for any except the unjustly prejudiced to accept, and the case was dismissed, *except for the sore back.* This is only one illustration of "going" for a conviction. It is such statements as these that give rise to the saying that a "vet.'s" evidence can be "got"—any road is insinuated—"for his fee."

My fees in such matters as these are few and far between, as it is almost always that those summoned belong to the needy and hard-working class, who have a struggle to make a living.

It is a stinging reflection on us that one of the body corporate, capable of giving such evidence as I have quoted, is taken from town to town to support the society; and in some of these towns there are local vets., men of honour and talent.

To show how far a beginning in an improper course may lead, just another case, and one more strictly professional than the previous.

A horse belonging to a cartman here had a serious enlargement in front of the knee, so large as to slightly interfere with the gait, but indolent and cool, rather than sensitive. A stimulant liniment was applied and exercise advised. On the second or third day the horse was stopped by the inspector. The owner had put him in a rolley weighing 10 cwt., and 15 cwt. of a load behind him, on a level road. The animal was taken out and brought to me, and as the enlargement was increased in size, especially at the anterio-inferior part, and the skin thinned, I opened it. The contents, except for the blood tinge from the cut skin, was perfectly clear serum. Although the evidence of the prosecution stated that "the limb was swollen from the shoulder to the foot," this could have been disproved by fifty witnesses, and I distinctly deny it. It is not however to the merits or demerits of the case that I call your attention, but to the professional examination of the V.S. for the society. I should have thought that in an examination of that kind, the animal should have been moved about; but superior powers of thought must be generated by earlier study in the solitude of a "swaler's" office.

The horse was turned round in the yard, I believe, but it was for the purpose *of passing a probe or needle a considerable distance through the incision made by me.* This I maintain was *entirely unnecessary, and constituted an act of cruelty much greater in degree* than that committed by the owner; and that opened the joint—an action most unprofessional, and if I can persuade my client he will sue him for damage inflicted. When I told the inspector, he said, "I did not see him;" and when I affirmed that there were witnesses who had, he said, "I was talking to the police inspector." The fact of it is if he knew about it, he did not wish to commit himself.

With regard to the load behind the horse, although the man exceeded his instructions in working him at all, the weight was not so great as compared with the animal's capabilities. On the road in question he could take a rolley 25 to 30 cwt. and from 2 tons to 50 cwt.

Before leaving the subject I would ask your readers whether they do not think that gross acts of cruelty are too common *inside* the profession; some of these are not intentional, but for want of operative skill or nerve, and if I had my way I would have every student pass at his final an examination in operative veterinary surgery.

W. Cox, M.R.C.V.S.L.

Newcastle.

Sir,—I have often noticed with pain the suffering endured by horses attached to heavy-laden vans in their endeavours to draw their loads up steep inclines in roads paved with wood, or some substance which becomes very slippery in wet weather, and it is strange that so little is done to remedy

this state of things, and provide what is so necessary—a foothold for the horses.

This could be done, I think, by adopting the following plan, *i.e.*, to construct at the upside of the roadway, wherever there is an incline, a causeway the width of an ordinary vehicle, paved in the centre with small rough stone blocks, and at the sides with long smooth slabs, thus, while no opposition is offered to the wheels, a foothold is afforded to the horses.

Only heavy-laden vehicles need use this causeway, others could run on the ordinary pavement of wood, asphalte, granite, etc.

This plan is in operation on some of the bridges across the Thames in London, and if there, why not in other places where it is more needed?

I trust that any who see this, and can use their influence for securing the adoption of this plan will.

"HUMIMATIS."

"EXPERIMENTAL THERAPEUTICS."

SIR,—These lines are penned solely because Mr. J. Dowling Allman, Associate of the Pharmaceutical Society (Lond.), writes (though why he does I don't know, unless he considers us very backward) in your issue for June, "I say to practitioners, especially to the young *school*, Go in for every new drug that crops up, make yourself fully acquainted with its action." As I desire here to be personal, if you will allow me, sir, I must quote other passages of Mr. Allman's article. This gentleman says (we may miss his meaning), "Anything approaching personality in the matter of discussion, especially in SCIENCE, I have a very strong objection to." The word science, Mr. Allman italicises; and, later on, says, "Regarding Mr. Smith's intravenous experiments with such toxic drugs as carbolic acid, iodine, etc., I fail to see the *cui bono* of his experiments."

These remarks of Mr. Allman being distinctly personal (are they not?), we see that he considers the experiments and conclusions of Mr. Smith beyond and outside the boundaries of science. Now, without quoting Mr. Allman *seriatim*, as I should if I had the leisure, may I, as a veterinarian who is almost daily in contact with some of three or four fatal bacterial diseases, be allowed to assure Mr. Allman (I do not presume to assure veterinary practitioners, especially those of the "young school," who of all others Mr. Allman kindly thinks require his fostering advice), that some—in fact many—people who are not associates of, much less members of, the Pharmaceutical Society (Lond.), do see the *cui bono* of these experiments, etc., and are very grateful for them and for the fulness of detail with which their record is rendered.

Self-reliant practitioners capable of judging of, and of interpreting, the effects of drugs and of other therapeutic agents, must endorse Mr. Smith's dictum ("that too many drugs are used in veterinary practice, and that for all practical purposes the number might be curtailed,") which has startled his pharmacist critic.

Mr. Allman speaks of "the most advanced clinicians and therapeutists," and, further on, of "new drugs commended by great men."

The student and the younger practitioner of the "young school," while, as yet, through inexperience, inclined to allow others to think for them, are in some danger—not very great, perhaps—of being induced to believe that "the most advanced clinicians," etc., ought to and do use large numbers of drugs. Few do so. Mr. Allman quotes Mr. Smith as not "believing in aconite as a therapeutic agent" (in herbivorous animals is, I presume, understood). Mr. A. says, "Judging from the continuous and excellent results obtained from its use in the hands of practical and experienced clinicians, I still commend aconite tincture as one of our most important drugs in the treatment of nearly all inflammatory diseases." Now, we know that hundreds of cases of

inflammation of all parts and organs of the animal frame have recovered after the exhibition of aconite; and that a far greater number of hundreds of cases of "inflammation" have assumed the condition of resolution without the assistance of drugs in any form. I myself see and navigate one or two cases of inflammatory diseases, of one sort or another daily, and the recoveries are without aconite, and I know that the same cases (in herbivora, at any rate) would recover with aconite, though neither more nor less pleasantly nor quickly than without it, in the doses usually exhibited by veterinarians. Years ago it was my daily duty to use aconite at the prescription of practitioners, one an examiner of the R.C.V.S., another of the Highland and Agricultural Society of Scotland, both since Principals of colleges, and it was my lot to use it in the practice of a gentleman, probably too young at that time to be called an "eminent or advanced clinician," though he had, to quote Mr. Allman once more, "the responsibility of a large mixed practice on his hands, where the various maladies that arise in a large mixed practice," etc., etc. He incurred very large drug bills, but I do not know, nor even think, that I ever saw aconite of itself once ameliorate a symptom. (He did not use it in canine practice.) The preparations we used were Fleming's tincture, and the tincture of the British Pharmacopœia. As an example of the scientific genius of some modern curers and believers in drugs (simple men!), at whom the old saying, *Post hoc ergo propter hoc*, ought to be lovingly flung once a month, may I remind your readers of Dr. Leone Levi's (of Pisa, was he not?) announcement of his "*cure*" of Glanders in the horse, by the injection of some agent (iodine, wasn't it?) into the windpipe? Portions of the medical press, and the lay press generally, did, unscientifically and gapingly, look on this assertion as a triumph of the mediciners. Did Dr. Leone Levi labour under the complaisant credulity that for ages has hindered, leads, and always will lead unscientific, easily-satisfied, superficial clinicians to deceive themselves? Why did he not ask himself if he were in the presence of Glanders, or of some similar disease? Could this therapeutist never have heard of Strangles, a fever in which spontaneous recoveries often average ninety-eight per cent.? Is your space wasted when it is mentioned that a medical man in South Africa, having discovered a plant in use by a Kaffir tribe as a specific, in what he hesitates not to call equine Glanders, is recommending it to his profession as a germ-destroyer!!!

We have among drugs, old and new, very few indeed worth the name of specifics, few of more than the slightest and even imaginary value at all in the inflammatory affections referred to by Mr. Allman's (he says scientific, and not personal) critique of Mr. Smith's doings; but this does not justify, I venture to think, Mr. Allman's practitioner of the young school to hurriedly do as that gentleman appears to advise, "to go in for every new drug that crops up," though the ordinary employer of such an experimental practitioner has not so much to fear as he might at first sight imagine he has, for purely herbivorous animals are tolerant of very large quantities of drugs, except of alkaloids and one or two others.

Our profession and the whole world and his wife will probably always be just as thankful to Mr. Allman as to any one else who will publish, as Mr. Smith has done, the results of original experiments. It is almost certain that we are anxious to regard and able to utilise experiments on animals and therapeutics by whomsoever originated or carried out; but practising and practical veterinarians are hardly the men to imitate and appreciate Mr. Allman's preference for the *mere opinion* of his "most advanced clinicians, therapeutists, and great men." Mr. Allman seems to claim merit because he commends, to our benighted profession, aconite and other drugs, "in CONSEQUENCE OF THE RESULTS OBTAINED in the hands of practical experienced

clinicians." To us the merit of Mr. Smith's experiments is greater than the mere opinions of Mr. Allman's clinicians. We prefer one fact, and to be allowed our own interpretation of it, to fifty opinions, even if accompanied by the interpretation, advice, and proffered guidance of associates of the Pharmaceutical Society.

JOHN CAMMACK, M.R.C.V.S.

Kimberley, South Africa.

VETERINARY EDUCATION AND EXAMINATIONS.

SIR,—Mr. Greaves has again brought forward the subject of the examination of, and methods of educating the veterinary student—a subject on which he has written much, and no doubt studied deeply; he therefore has every claim to be regarded as a specialist in the matter, and in his own language, like other specialists he has his crotchets.

The present Examining Board seems remarkable no less for the manner in which it troubles students at the final examination, than for the marked ease with which it allows men to pass the A examination. Nearly thirty-three per cent. take honours in the latter examination, while in the final about one per cent. only do so. During the early part of the Board's existence the A examination was a mere farce. A fair knowledge of chemistry enabled a student to pass his materia medica as well as his chemistry, for the two subjects are closely allied. The botany table gave no trouble at all. After reading hard for nine months I was not asked a single question that the most elementary reading would not have done for. And after numerous inquiries I found this was the case generally. In 1881 vegetable histology was a subject that many students worked hard at—in fact, every man who was not well up funked the botany table. There was no scamping it. Chemistry received equal attention; as a result materia medica came easy.

Having thus had a taste of work in the first year, men were stimulated to work in a thorough manner for their second and third examinations. As a student works in the first year, so will he work in the second and third. Scamp the A examination, and the B and C will receive a similar fate. Down to 1885 chemistry was the one bugbear of the A examination. A knowledge of structural and developmental botany enables the student to understand and remember the histology and development of the animal body with greater ease than if he commenced the study of the latter without knowing the former. Botany has thus an educational value apart from its veterinary aspect. We are inclined to look to the latter alone.

Retain specialist examiners in chemistry, botany, and physiology, and make the A and B examinations more stringent, and there will be less dissatisfaction with the C examination. The examiners in the latter are doing their work fairly and well. And I will here add my testimony to that of "Veritas" as to the fairness of Mr. Robinson as an examiner. Formerly many students remained in Class A for years, but this, I believe, is now rare, and no particular hitch occurs until the student goes up for his diploma. Mr. Greaves' remarks as to specialists and the anomalies of examinations are almost too absurd to notice. He is anything but complimentary when he says: "That *any dozen* successful students, if examined again a month after, one-half of them would fail." If this is true, then the examiners are passing far too many, or else they know nothing of their work. That they do, however, is I think proved.

Students judge one another, and their decision is usually in accord with that of the examiners. When not so, the latter have often given their verdict in the student's favour.

As usual, Mr. Greaves finishes his letter by giving some glaring error or other committed by an examiner. But, unfortunately, the case mentioned

cuts in a manner not intended. If asked where to send a man in order that he might guard himself from committing the error mentioned, I would say go to the Royal Veterinary College. No student should ever commit any of the errors which Mr. Greaves has mentioned from time to time after three years' residence at college. If he does, then pupilage would not have saved him. If Mr. Greaves had inquired into the antecedents of this very intelligent student, he would probably have learned that he was rarely seen at college in the afternoons, and between lectures was generally in the waiting-room. At lectures he occupied the back seat, and rarely attended them if he could get any one to call his name. He would perhaps frequently boast of having *seen practice*, and was always the first to find fault with the different professors. He made big mistakes daily at college, and naturally would make them before the examiners. Yet this is the type of student Mr. Greaves discusses at such length. Is he worth talking about? Does Mr. Greaves think he could teach him? I am afraid he would fail. Over such student the qualifications of both examiners and teachers are questioned, and the poor fellow is said not to have had opportunities.

Pupilage is valuable if the student, or pupil, regards it at its proper value. But when he makes it do duty for work at college, pupilage has done him infinite harm.

Mr. Greaves says:—"Remembering that youth is the special period in life when habits are formed, he should have every possible opportunity given him to work amongst sick and lame horses for two or three years: have the why and the wherefore constantly explained to him before going to college." Granted. But the pupils who would work and learn anything at all are the very men who at college are the working students, and for whom compulsory pupilage is not necessary. As students they are the backbone of the college, and as practitioners they will be the backbone of the profession.

To have compulsory pupilage, in order to attempt to benefit a class of students that won't work at college, is to do a great injustice to those who will, and will be the means of keeping many good men out of the profession.

I have become prolix, and will conclude by saying that Mr. Greaves' system of educating and examining students is one, I think, likely to foster a system of "stable" medicine, rather than of imparting a scientific tone to veterinary education.

F. T. HARVEY.

St. Columb.

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from W. G. R. A. Cox, Newcastle-on-Tyne; J. A. Nunn, A.V.D., Natal; C. Sheather, London; H. Sumner, Liverpool; R. W. Burke, A.V.D., Jubbulpore, India; J. Cammack, Kimberley, South Africa; J. Blakeway, Stourbridge; J. E. Jarvis, London; F. T. Harvey, St. Colomb; E. A. Hollingham, Tunbridge Wells; "Humimatis"; W. Young, London; J. T. King, Bournemouth; W. Broughton, Leeds; A. Baird, Edinburgh; J. Hunter, Skene.

BOOKS AND PAMPHLETS: Proces Verbal de l'Academie Royale de Médecine; Bulletin et Memoires de la Société Centrale de Médicine Vétérinaire; *J. Struska*, Anleitung zu den Anatomischen Präparir-Uebungen.

JOURNALS, ETC.: *Journal of National Agricultural Society of Victoria; Mark Lane Express; Recueil de Méd. Vetérinaire; Annales de Méd. Vétérinaire; Wochenschrift für Thierheilkunde und Viehzucht; Osterreichische Zeitschritt für Wissenschaftliche Veterinärkunde; Thierarzt; Hufschmied; Echo Vétérinaire; Révue Vétérinaire; Lancet: British Medical Journal; Live Stock Journal; Edinburgh Medical Journal; American Veterinary Review; American Live Stock Journal; London Medical Record.*

NEWSPAPERS: *Stourbridge County Express; Yorkshire Post; Manchester Evening Mail; Morning Post.*